Regulations and Statutes

Included here are the relevant regulations and statutes that are referenced in the tariff. These have been edited and/or reformatted for emphasis and clarity.

However, note that things can change, so what is included here is not official. The material presented here is for convenience, not standing.

1

30 TAC 290.44(a) thru (d) - Water Distribution

TITLE 30
ENVIRONMENTAL QUALITY
PART 1
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
CHAPTER 290
PUBLIC DRINKING WATER
SUBCHAPTER D
RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS

RULE §290.44 Water Distribution

(a) Design and standards. **All potable water distribution systems including pump stations, mains, and both ground and elevated storage tanks, shall be designed, installed, and constructed in accordance with current American Water Works Association (AWWA) standards with reference to materials to be used and construction procedures to be followed. In the absence of AWWA standards, commission review may be based upon the standards of the American Society for Testing and Materials (ASTM), commercial, and other recognized standards utilized by licensed professional engineers.**

(1) All newly installed pipes and related products must conform to American National Standards Institute/NSF International (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI.

(2) All plastic pipes for use in public water systems must also bear the NSF International Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 150 pounds per square inch (psi) or a standard dimension ratio of 26 or less.

(3) No pipe which has been used for any purpose other than the conveyance of drinking water shall be accepted or relocated for use in any public drinking water supply.

(4) **Water transmission and distribution lines must be installed in accordance with the manufacturer's instructions. However, the top of the waterline must be located below the frost line and in no case shall the top of the waterline be less than 24 inches below ground surface.**

(5) The hydrostatic leakage rate shall not exceed the amount allowed or recommended by AWWA formulas.

(b) Lead ban. { See elsewhere in this tariff]

(c) **Minimum waterline sizes.** The minimum waterline sizes are for domestic flows only and do not consider fire flows. Larger pipe sizes shall be used when the licensed professional engineer deems it necessary. It should be noted that the required sizes are based strictly on the number of customers to be served and not on the distances between connections or differences in elevation or the type of pipe. No new waterline less than two inches in diameter will be allowed to be installed in a public water system distribution system. These minimum line sizes do not apply to individual customer service lines.

Maximum Number of Connection	Minimum Line Size (inches)
10	2
25	2.5
50	3
100	4
150	5
250	6
>250	8 and larger

(d) Minimum pressure requirement. The system must be designed to maintain a minimum pressure of 35 psi at all points within the distribution network at flow rates of at least 1.5 gallons per minute per connection. When the system is intended to provide fire fighting capability, it must also be designed to maintain a minimum pressure of 20 psi under combined fire and drinking water flow conditions. The distribution system of public water systems that are also affected utilities must be designed to meet the requirements of §290.45(h) of this title (relating to Minimum Water System Capacity Requirements).

(1) **Air release devices shall be installed in the distribution system at all points where topography or other factors may create air locks in the lines.** Air release devices shall be installed in such a manner as to preclude the possibility of submergence or possible entrance of contaminants. In this respect, all openings to the atmosphere shall be covered with 16-mesh or finer, corrosion-resistant screening material or an acceptable equivalent.

(2) [not relevant to Marsha WSC - single pressure plane]

(3) [no service connections require booster pumps]

(4) Each community public water system shall provide accurate metering devices at each residential, commercial, or industrial service connection for the accumulation of water usage data. A water system that furnishes the services or commodity only to itself or its employees when that service or commodity is not resold to or used by others is exempt from this requirement.

(5) **The system shall be provided with sufficient valves and blowoffs so that necessary repairs can be made without undue interruption of service over any considerable area and for flushing the system when required. The engineering report shall establish criteria for this design.**

(6) **The system shall be designed to afford effective circulation of water with a minimum of dead ends. All dead-end mains shall be provided with acceptable flush valves and discharge piping. All dead-end lines less than two inches in diameter will not require flush valves if they end at a customer service. Where dead ends are necessary as a stage in the growth of the system, they shall be located and arranged to ultimately connect the ends to provide circulation.**

Texas Administrative Code
TCEQ regulation

30 TAC 290.44(h) - Backflow, siphonage.

(1) No water connection from any public drinking water supply system shall be allowed to any residence or establishment where an actual or potential contamination hazard exists unless the public water facilities are protected from contamination.

(A) At any residence or establishment where an actual or potential contamination hazard exists, additional protection shall be required at the meter in the form of an air gap or backflow prevention assembly. The type of backflow prevention assembly required shall be determined by the specific potential hazard identified in §290.47(f) of this title (relating to Appendices).

(B) At any residence or establishment where an actual or potential contamination hazard exists and an adequate internal cross-connection control program is in effect, backflow protection at the water service entrance or meter is not required.

(i) An adequate internal cross-connection control program shall include an annual inspection and testing by a licensed backflow prevention assembly tester on all backflow prevention assemblies used for health hazard protection.

(ii) Copies of all such inspection and test reports must be obtained and kept on file by the water purveyor.

(iii) It will be the responsibility of the water purveyor to ensure that these requirements are met.

(2) No water connection from any public drinking water supply system shall be connected to any condensing, cooling, or industrial process or any other system of nonpotable usage over which the public water supply system officials do not have sanitary control, unless the said connection is made in accordance with the requirements of paragraph (1) of this subsection. Water from such systems cannot be returned to the potable water supply.

(3) Overhead bulk water dispensing stations must be provided with an air gap between the filling outlet hose and the receiving tank to protect against back siphonage and cross-contamination.

(4) All backflow prevention assemblies that are required according to this section and associated table located in §290.47(f) of this title shall be tested upon installation by a licensed backflow prevention assembly tester and certified to be operating within specifications. Backflow prevention assemblies which are installed to provide protection against health hazards must also be tested and certified to be operating within specifications at least annually by a licensed backflow prevention assembly tester.

(A) Backflow prevention assembly testers shall have completed an executive director-approved course on cross-connection control and backflow prevention assembly testing, pass an examination administered by the executive director, and hold a current license as a backflow prevention assembly tester.

(i) Backflow prevention assembly testers are qualified to test and repair assemblies on any domestic, commercial, industrial, or irrigation service.

(ii) Backflow prevention assembly testers may test and repair assemblies on firelines only if they are permanently employed by an Approved Fireline Contractor. The Texas Department of Insurance's State Fire Marshal's Office requires that any person performing maintenance on firelines must be employed by an Approved Fireline Contractor.

(B) Gauges used in the testing of backflow prevention assemblies shall be tested for accuracy annually in accordance with the University of Southern California's Manual of Cross-Connection Control or the AWWA's Recommended Practice for Backflow Prevention and Cross-Connection Control (AWWA Manual M14). Public water systems shall require testers to include test gauge serial numbers on the Backflow Prevention Assembly Test and Maintenance Report (commission Form 20700), and ensure testers have gauges tested for accuracy.

(C) A test report must be completed by the recognized backflow prevention assembly tester for each assembly tested. The signed and dated original must be submitted to the public water supplier for recordkeeping purposes. Any form which varies from the format specified in commission Form 20700 must be approved by the executive director prior to being placed in use.

(5) The use of a backflow prevention assembly at the service connection shall be considered as additional backflow protection and shall not negate the use of backflow protection on internal hazards as outlined and enforced by local plumbing codes.

(6) At any residence or establishment where there is no actual or potential contamination hazard, a backflow prevention assembly is not required

30 TAC 290.45(f) - Minimum Water System Capacity Requirements

TITLE 30
ENVIRONMENTAL QUALITY
PART 1
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
CHAPTER 290
PUBLIC DRINKING WATER
SUBCHAPTER D
RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS
RULE §290.45
Minimum Water System Capacity Requirements

(f) Purchased water systems. The following requirements apply only to systems which purchase treated water to meet all or part of their production, storage, service pump, or pressure maintenance capacity requirements.

(1) The water purchase contract must be available to the executive director in order that production, storage, service pump, or pressure maintenance capacity may be properly evaluated. For purposes of this section, a contract may be defined as a signed written document of specific terms agreeable to the water purchaser and the water wholesaler, or in its absence, a memorandum or letter of understanding between the water purchaser and the water wholesaler.

(2) The contract shall authorize the purchase of enough water to meet the monthly or annual needs of the purchaser.

(3) The contract shall also establish the maximum rate at which water may be drafted on a daily and hourly basis. In the absence of specific maximum daily or maximum hourly rates in the contract, a uniform purchase rate for the contract period will be used.

(4) The maximum authorized daily purchase rate specified in the contract, or a uniform purchase rate in the absence of a specified daily purchase rate, plus the actual production capacity of the system must be at least 0.6 gpm per connection.

[Austin can provide, but we cannot distribute as pipes are too small]

[160 connections at 0.6 gpm is 96gpm, which is beyond capability for 2-inch]

(5) **For systems which purchase water under direct pressure, the maximum hourly purchase authorized by the contract plus the actual service pump capacity of the system must be at least 2.0 gpm per connection or provide at least 1,000 gpm and be able to meet peak hourly demands, whichever is less.**

[Austin can provide, but we cannot distribute as pipes are too small]

[160 connections at 2 gpm is 320 gpm, which is way beyond capability for 2-inch line]

(6) The purchaser is responsible for meeting all production requirements. If additional capacity to meet increased demands cannot be attained from the wholesaler through a new or amended contract, additional capacity must be obtained from water purchase contracts with other entities, new wells, or surface water treatment facilities. However, if the water purchase contract prohibits the purchaser from securing water from sources other than the wholesaler, the wholesaler is responsible for meeting all production requirements.

[Austin meets all production requirements. What we have is distribution limitation]

(7) All other minimum capacity requirements specified in this section and §290.46(x) and (y) of this title shall apply.

[30 TAC 290.46(x) does not apply to us]

[30 TAC 290.46(y) is fire hydrant flow standards, and we have NO fire flow capability at all.

Water Code 13.002 - Definitions
[slightly reformatted and edited for clarity and emphasis]

Water Code
Sec. 13.002. DEFINITIONS. In this chapter:

(1-a) "Landowner," "owner of a tract of land," and "owners of each tract of land" include multiple owners of a single deeded tract of land **as shown on the appraisal roll of the appraisal district established for each county** in which the property is located.

[For us, that is the Travis County Central Appraisal District, tcad.org]

(11) "Member" means a person who holds a membership in a water supply or sewer service corporation and **is a record owner of a fee simple title to property** in an area served by a water supply or sewer service corporation or a person who is granted a membership and who either currently receives or will be eligible to receive water or sewer utility service from the corporation. In determining member control of a water supply or sewer service corporation, a person is entitled to only one vote regardless of the number of memberships the person owns.

[Legal nit - we bill members, and only members or their designated agents]

(24) "Water supply or sewer service corporation" means a nonprofit corporation organized and operating under Chapter 67 that provides potable water service or sewer service for compensation and that has adopted and is operating in accordance with by-laws or articles of incorporation which ensure that it is member-owned and member-controlled. **The term does not include a corporation that provides retail water or sewer service to a person who is not a member**, except that the corporation may provide retail water or sewer service to a person who is not a member if the person only builds on or develops property to sell to another and the service is provided on an interim basis before the property is sold.

[Legal nit - Water Code 67 requires the use of an Election Auditor, as an independent third party to report election results. The results report from the auditor is our documentary evidence (proof) that we hold elections according to our bylaws and election procedures]

Water Code 13.043 - Appellate Jurisdiction

WATER CODE
TITLE 2. WATER ADMINISTRATION

SUBTITLE B. WATER RIGHTS
CHAPTER 13. WATER RATES AND SERVICES

SUBCHAPTER A. GENERAL PROVISIONS

[Edited for the portions that are applicable to water supply corporations. Reformatted for readability and emphasis. Statute text updated thru 88R-SB317, effective 18 June 2023]

Sec. 13.043. APPELLATE JURISDICTION.

(b) **Ratepayers** of the following entities **may appeal** the decision of the governing body of the entity affecting **their water**, drainage, or sewer **rates** to the utility commission:

(1) a nonprofit water supply or sewer service corporation created and operating under Chapter 67;

(c) **An appeal** under Subsection (b) **must be initiated** by filing a petition for review with the utility commission and the entity providing service **within 90 days after the effective day of the rate change** ... .

The petition must be signed by the lesser of 10,000 or **10 percent of those ratepayers** whose rates have been changed and who are eligible to appeal under Subsection (b).

(d) **In an appeal** under Subsection (b) of this section, **each person receiving a separate bill is considered a ratepayer**, but one person may not be considered more than one ratepayer regardless of the number of bills the person receives. The petition for review is considered properly signed if signed by a person, or the spouse of a person, in whose name utility service is carried.

(e) In an appeal under Subsection (b), the utility commission shall hear the appeal de novo and shall fix in its final order the rates the governing body should have fixed in the action from which the appeal was taken.

The utility commission
* may establish the effective date for the utility commission's rates at the original effective date as proposed by the service provider,
* may order refunds or allow a surcharge to recover lost revenues, and
* may allow recovery of reasonable expenses incurred by the retail public utility in

the appeal proceedings.

The utility commission may consider only

* the information that was available to the governing body at the time the governing body made its decision and
* evidence of reasonable expenses incurred by the retail public utility in the appeal proceedings.

The rates established by the utility commission in an appeal under Subsection (b) remain in effect

* until the first anniversary of the effective date proposed by the retail public utility for the rates being appealed or
* until changed by the service provider,

whichever date is later, unless the utility commission determines that a financial hardship exists.

(g) **An applicant for service** from ... a water supply or sewer service corporation **may appeal** to the utility commission **a decision** of the ... water supply or sewer service corporation **affecting the amount to be paid to obtain service** other than the regular membership or tap fees.

In addition to the factors specified under Subsection (j), in an appeal brought under this subsection the utility commission shall determine whether the amount paid by the applicant

* is consistent with the tariff of the water supply or sewer service corporation and
* is reasonably related to the cost of installing on-site and off-site facilities to provide service to that applicant.

If the utility commission finds the amount charged to be clearly unreasonable, it shall establish the fee to be paid for that applicant.

An appeal under this subsection **must be initiated within 90 days** after the date written notice is provided to the applicant or member of the decision of a ... water supply or sewer service corporation **relating to the applicant's initial request for that service**.

A determination made by the utility commission on an appeal under this subsection is binding on all similarly situated applicants for service, and the utility commission may not consider other appeals on the same issue until the applicable provisions of the tariff of the water supply or sewer service corporation are amended.

(g-1) **An applicant for service** from a water supply or sewer service corporation **may appeal**

to the utility commission for a determination of whether the regular membership fee or tap fee required to be paid to obtain service is consistent with the tariff of the water supply or sewer service corporation.

If the utility commission finds that the fee is inconsistent with the tariff of the water supply or sewer service corporation, the utility commission shall issue an order requiring the water supply or sewer service corporation to charge the applicant an amount consistent with the tariff.

An appeal under this subsection must be initiated not later than the 30th day after the date the water supply or sewer service corporation provides the applicant with the cost of obtaining service.

(h) The utility commission may, on a motion by the utility commission or by the appellant under Subsection (a), (b), or (f), establish interim rates to be in effect until a final decision is made.

(j) In an appeal under this section, the utility commission shall ensure that every appealed rate is just and reasonable. Rates shall not be unreasonably

* preferential,
* prejudicial, or
* discriminatory

but shall be

* sufficient,
* equitable, and
* consistent

in application to each class of customers.

The utility commission shall use a methodology that preserves the financial integrity of the retail public utility. ...

Water Code 67.011 - Powers of Corporation in Certain Counties

statute, Water Code, (warning - lacuna - there are two versions of this statute)
also population threshold unchanged by 88R-HB4559
Google search says Travis County population is 1,290,000 as of 2020 (search 5 May 2023)

[this has been reformatted somewhat for readability, and to provide emphasis and clarity]

Sec. 67.011. POWERS OF CORPORATION IN CERTAIN COUNTIES.

(a) In a county with a population of less than 3.3 million, a corporation may:

(1) own, hold, lease, or otherwise acquire water wells, springs, or other sources of water supply;

(2) build, operate, and maintain pipelines to transport water or wastewater;

(3) build and operate plants and equipment necessary to distribute water or to treat and dispose of wastewater;

(4) sell water or provide wastewater services to a political subdivision, a private corporation, or an individual; and

(5) establish and enforce reasonable customer water conservation practices and prohibit excessive or wasteful uses of potable water.

(b) A corporation may enforce customer water conservation practices under Subsection (a)(5) by assessing reasonable penalties as provided in the corporation's tariff.

A penalty may be appealed [to the PUCT] in the same manner as provided for appeal of new customer service costs under Section 13.043(g).

In an appeal, the commission shall approve a corporation's penalty if the commission determines

* **that the penalty is clearly stated in the tariff,**
* **that the penalty is reasonable, and**
* **that the corporation has deposited the penalty in a separate account dedicated to enhancing water supply for the benefit of all the corporation's customers.**

Water Code 67.016 - Transfer or Cancellation of Right of Participation

[slightly reformatted, and edited for emphasis and clarity]
["tariff" substituted for "rates, charges, and conditions of service" for clarity]

Water Code
Sec. 67.016. TRANSFER OR CANCELLATION OF STOCK, MEMBERSHIP, OR OTHER RIGHT OF PARTICIPATION.

(a) A person or entity that owns
* any stock of,
* is a member of, or
* has some other right of participation in

a corporation may not sell or transfer that stock, membership, or other right of participation to another person or entity except:

(1) by will to a person who is related to the testator within the second degree by consanguinity;

(2) by transfer without compensation to a person who is related to the owner of the stock or other interest within the second degree by consanguinity; or

(3) **by transfer without compensation or by sale to the corporation.**

(b) Subsection (a) does not apply to a person or entity that transfers the membership or other right of participation to another person or entity **as part of the conveyance of real estate** from which the membership or other right of participation arose.

(c) **The transfer** of stock, a membership, or another right of participation under this section **does not entitle** the transferee to water or sewer **service unless each condition** for water or sewer service **is met** as provided in the corporation's published "tariff".

A transfer and service application must be completed on the corporation's standardized forms and filed with the corporation's office in a timely manner.

The conditions of service may not require a personal appearance in the office of the corporation if the transferee agrees in writing to accept the "tariff".

(d) **The corporation may make water or sewer service provided as a result of stock, a membership, or another right of participation in the corporation conditional on ownership of the real estate designated to receive service and from which the membership or other right of participation arises.**

(e) The corporation may cancel a person's or other entity's stock, membership, or other right of participation if the person or entity fails to:

(1) meet the conditions for water or sewer service prescribed by the corporation's published "tariff"; or

(2) comply with any other condition placed on the receipt of water or sewer service under the stock, membership, or other right of participation.

(f) Consistent with Subsection (a), the corporation may reassign canceled stock or a canceled membership or other right of participation to a person or entity that has legal title to the real estate from which the canceled membership or other right of participation arose and for which water or sewer service is requested.

(g) Notwithstanding Subsection (a), the corporation shall reassign canceled stock or a canceled membership or other right of participation to a person or entity that acquires the real estate from which the membership or other right of participation arose through judicial or nonjudicial foreclosure. The corporation may require proof of ownership resulting from the foreclosure.

(h) Service provided following a transfer under Subsection (f) or (g) is made subject to compliance with the conditions for water or sewer service prescribed by the corporation's published "tariff".

Added by Acts 1997, 75th Leg., ch. 166, Sec. 2, eff. Sept. 1, 1997.

Utilities Code 182, Subchapter A - Payment Date of Utility Bill for Elderly

UTILITIES CODE

TITLE 4. DELIVERY OF UTILITY SERVICES

SUBTITLE B. PROVISIONS REGULATING DELIVERY OF SERVICES

CHAPTER 182. RIGHTS OF UTILITY CUSTOMERS

SUBCHAPTER A. PAYMENT DATE OF UTILITY BILL FOR ELDERLY INDIVIDUAL

Sec. 182.001. DEFINITIONS. In this subchapter:

(1) "Elderly individual" means an individual who is 60 years of age or older.

(2) "Utility" means an electric, gas, water, or telephone utility operated by a public or private entity.

Sec. 182.002. DELAY OF BILL PAYMENT DATE FOR ELDERLY INDIVIDUAL.

(a) On request by an elderly individual, a utility shall delay without penalty the payment date of a bill for providing utility service to that individual until the 25th day after the date the bill is issued.

(b) **This subchapter applies only to an elderly individual who:**

(1) is a residential customer; and

(2) occupies the entire premises for which a delay is requested.

Sec. 182.003. REQUEST FOR DELAY. An elderly individual may request that the utility implement the delay under Section 182.002 for:

(1) the most recent utility bill; or

(2) the most recent utility bill and each subsequent utility bill.

Sec. 182.004. PROOF OF AGE. A utility may require an individual requesting a delay under this subchapter to present reasonable proof that the individual is 60 years of age or older.

Sec. 182.005. CERTAIN UTILITIES NOT AFFECTED. This subchapter does not apply to a utility that:

(1) does not assess a late payment charge on a residential customer;

(2) does not suspend service before the 26th day after the date of the bill for which collection action is taken; and

(3) is regulated under Title 2.

[MWSC is not regulated under Utility Code, Title 2, and so does not qualify - so the subchapter DOES apply]

Utilities Code 182, Subchapter B - Disclosure of Customer Information

UTILITIES CODE

TITLE 4. DELIVERY OF UTILITY SERVICES

SUBTITLE B. PROVISIONS REGULATING DELIVERY OF SERVICES

CHAPTER 182. RIGHTS OF UTILITY CUSTOMERS

SUBCHAPTER B. DISCLOSURE OF CUSTOMER INFORMATION

Sec. 182.051. DEFINITIONS. In this subchapter:

(1) [not relevant to us]

(2) "Governmental body" has the meaning assigned by Section 552.003, Government Code.

(3) "Government-operated utility" means a governmental body or an entity governed by a governmental body that, for compensation, provides **water**, wastewater, sewer, gas, garbage, electricity, or drainage service.

(4) "Personal information" means an
- individual's address,
- telephone number, or
- social security number.

["Governmental body" is defined in
GC 552.003 (1)(A)(ix) the governing body of a nonprofit corporation organized under Chapter 67, Water Code, that provides a water supply or wastewater service, or both, and is exempt from ad valorem taxation under Section 11.30, Tax Code;]

[we are NOT exempt from ad valorem taxes]

Sec. 182.052. DISCLOSURE OF PERSONAL INFORMATION.

(a) Except as provided by Section 182.054, a government-operated utility may not disclose personal information in a customer's account record, or any information relating to
- the volume or units of utility usage or
- the amounts billed to or collected from the individual for utility usage, unless the customer requests that the government-operated utility disclose the information.

Property Code 92.008 - Interruption of Utilities (Residential)

PROPERTY CODE

TITLE 8. LANDLORD AND TENANT

CHAPTER 92. RESIDENTIAL TENANCIES

SUBCHAPTER A. GENERAL PROVISIONS

Sec. 92.008. INTERRUPTION OF UTILITIES.

(a) A landlord or a landlord's agent may not interrupt or cause the interruption of utility service paid for directly to the utility company by a tenant unless the interruption results from bona fide repairs, construction, or an emergency.

(b) Except as provided by this section, **a landlord may not interrupt** or cause the interruption of **water**, wastewater, gas, or electric service **furnished to a tenant by the landlord as an incident of the tenancy** or by other agreement unless the interruption results from bona fide repairs, construction, or an emergency.

(c) , (d), and (e) Repealed

(f) If a landlord or a landlord's agent violates this section, the tenant may:

(1) either recover possession of the premises or terminate the lease; and

(2) in addition to other remedies available under law, recover from the landlord an amount equal to the sum of the tenant's actual damages, one month's rent plus $1,000, reasonable attorney's fees, and court costs, less any delinquent rents or other sums for which the tenant is liable to the landlord.

(g) A provision of a lease that purports to waive a right or to exempt a party from a liability or duty under this section is void.

(h) thru (r) are concerned with electric service

Property Code 93.002 - Interruption of Utilities (Commercial)

PROPERTY CODE

TITLE 8. LANDLORD AND TENANT

CHAPTER 93. COMMERCIAL TENANCIES

Sec. 93.002. INTERRUPTION OF UTILITIES, REMOVAL OF PROPERTY, AND EXCLUSION OF COMMERCIAL TENANT.

(a) A landlord or a landlord's agent may not interrupt or cause the interruption of utility service paid for directly to the utility company by a tenant unless the interruption results from bona fide repairs, construction, or an emergency.

[note - this differs from the residential service termination by not prohibiting a landlord from discontinuing service to an occupied commercial property.]

(b) [not relevant]

(c) [not relevant]

(d) [not relevant]

(e) [not relevant]

(f) [not relevant]

(g) [not relevant]

(h) A lease supersedes this section to the extent of any conflict.

1

Submittals

Copyright Notice and Fair Use

Manufacturer submittal sheets are typically copyrighted "all rights reserved".

Manufacturer submittal sheets are being provided here as guidance only. This tariff makes reference to a number of parts and requirements that have very specific technical requirements. The people who need to know those details will most likely have no experience or guidance on what to do with those requirements, what the products look like, or have a clue on what the use or function of the product is for. The manufacturer submittal sheets presented here are for education and reference.

Also, the manufacturer submittals here are product suggestions, not requirements. An equivalent product that does the same job, will be equally acceptable.

Marsha WSC does not have any financial interest in any of these products.

1

"Apollo" Valves
SUBMITTAL SHEET

HBV2 LF/HBVAF2 LF/HBDUC/LF

38-300/38LF-300/38LF-40D Series Hose Connection Vacuum Breakers

Job Name:	
Job Location:	
Engineer:	
Contractor:	
Tag:	
PO#:	
Rep:	
Wholesale Dist.:	

DESCRIPTION

The **Apollo® Models HBV2 LF, HBVAF2 LF, HBDUC, and HBDUC LF Hose Connection Vacuum Breakers** are designed to prevent cross-connection caused by back-siphonage. The **Apollo® Model HBDUC Hose Bibb Dual Check Backflow Preventer** also prevents backflow due to low head back-pressure.

FEATURES

HBV2 LF(38LF-314)
- Tamper-Proof Protection
- Corrosion Resistant
- Manual Drain Feature
- Apollo International™
- Lead Free to NSF/ANSI 372

HBVAF2 LF (38LF-414)
- For Wall And Yard Hydrant Application
- Tamper-Proof Protection
- Corrosion Resistant
- Lead Free to NSF 372
- Anti-Freeze Automatic Drain Feature
- Apollo International™

HBDUC (38/38LF-304-02)
- Corrosion Resistant Body and Checks
- Low Head Loss
- Easy to Install with Break-Away Set Screw
- Made in USA
- Lead Free Options Available

PERFORMANCE RATING

- Maximum Supply Pressure:
  125 psi (38-314/414)
  150 psi (38-304-02)
- Temperature Range: 33°F – 180°F

APPROVALS

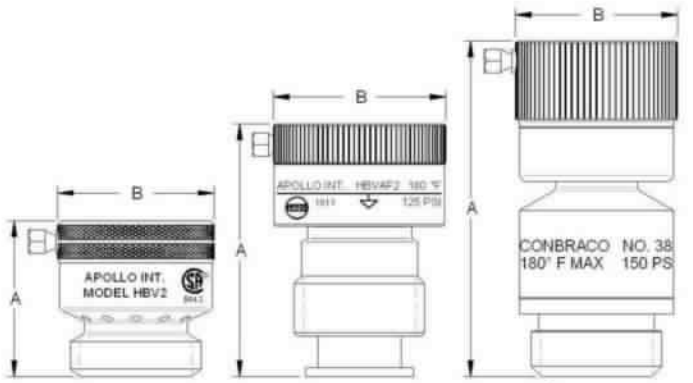
- ASSE 1011, CSA B64.2 and IAPMO Listed (38LF-314/414)
- ASSE 1052 and CSA B64.2 Listed (38/38LF-304-02)

STANDARD MATERIALS LIST

HBV2/HBVAF2	
BODY	Brass
CHECK DISC/DIAPHRAGM	Buna N
SPRING	Stainless Steel
HBDUC	
BODY	Brass
SEATS	EPDM
CHECK COMPONENTS	Stainless Steel
CHECK GUIDE	Acetal

DIMENSIONS

MODEL NUMBER	PART NUMBER	DIMENSIONS (IN.)		WT. (LB.)
		A	B	
HBV2-34	38-314-AS	1-1/4	1-1/4	0.15
HBVAF2-34	38-414-AS	2	1-3/8	0.25
HBDUC-34	38-304-02	2-11/16	1-5/16	0.46



H B V 2 L F (38LF-314) | HBVAF2LF (38LF-414) | 38/38LF-30402

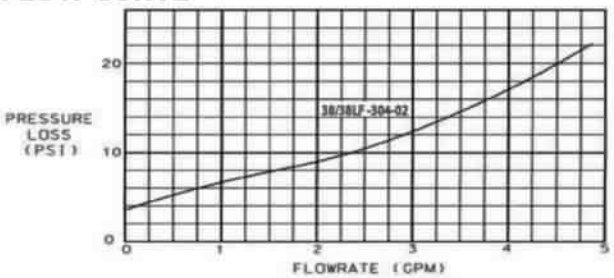
MODEL NUMBER MATRIX

38LF	- X 14	- X X
	SERIES	FINISH
	3 - 300 SERIES (3/4" HOSE CONNECTION)	AS - SATIN BRASS
	4 - 400 SERIES (3/4" HOSE CONNECTION)	CS - SATIN CHROME (HBV2 ONLY)

PART NUMBER MATRIX *Satin Brass Finish Only*

38/38LF	- 304	- 02
	SERIES	FINISH
	3 - 300 SERIES (3/4" HOSE CONNECTION)	AS - SATIN BRASS

FLOW CURVE



**LEAD FREE: The wetted surfaces of this product shall contain no more than 0.25% lead by weighted average. Complies with Federal Public Law 111-380. ANSI 3rd party approved and listed.*

LEGEND VALVE

Lead-free design is suitable for all California and Vermont potable water installations

www.legendvalve.com
1-800-752-2082

SUBMITTAL SHEET

JOB NAME _____ ITEM TAG _____

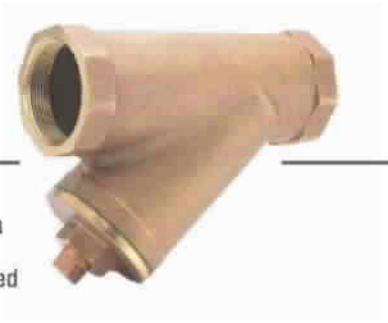
JOB LOCATION _____ PART NUMBER _____

CONTRACTOR _____ DATE _____

ENGINEER APPROVAL _____ DATE _____

LEAD FREE BRONZE Y-STRAINER

T/S-15 No-lead



Lead-free design is suitable for all California and Vermont potable water installations

Heavy-duty, full-pattern bronze construction resists pipeline stresses and distortion

Threaded or sweat end connections

Standardly equipped with a 304 stainless steel 20-mesh screen or 1/16" hole diameter perforated strainer

Square-head closure plug furnished

Ideal for protecting downstream components, by trapping and holding debris.

- Complies with California and Vermont lead-free requirements, as certified by the Water Quality Association
- Female threaded ends comply with ANSI/ASME B1.20.1
- Solder cup ends comply with ANSI/ASME B16.18

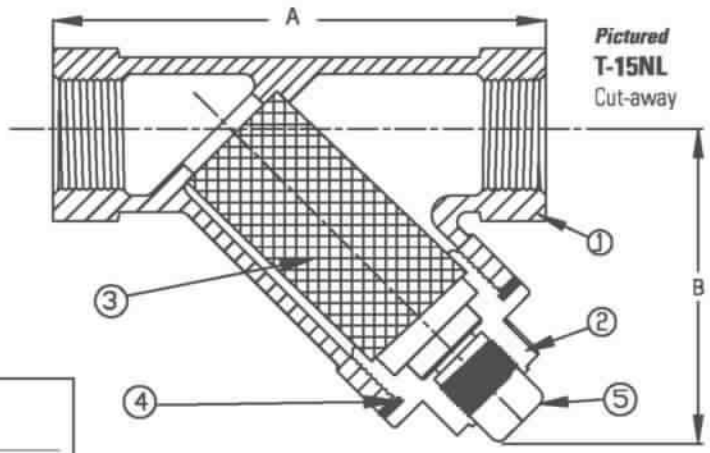
Working Pressure, Non-Shock (PSI)
Cold working pressure (CWP): 300

Saturated steam (WSP): 150

Screen and Strainer Type
20-Mesh screen 1/4" - 2"

1/16" Perf. Strainer 2-1/2" & 3"

Replacement 20-Mesh or optional 40 or 80 Mesh screens available



Pictured
T-15NL
Cut-away

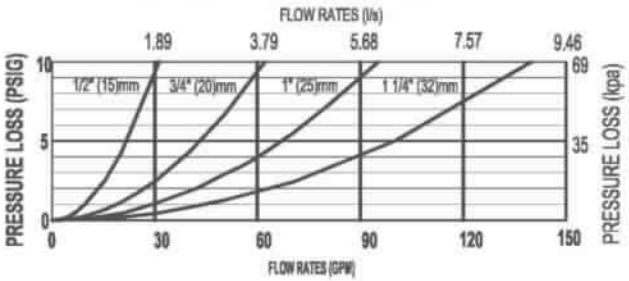
MATERIAL SPECIFICATION

PART	MATERIAL	SPECIFICATION
1 Body	Lead-free cast bronze	ASTM B584 UNS C89836
2 Cap	Lead-free cast bronze	ASTM B584 UNS C89836
3 Screen or Strainer	Stainless Steel	ASTM A240 UNS S30400 (304)
4 Cap gasket	Nitrilic bonded non-asbestos fiber Commercial grade	
5 Closure (blowoff) plug	Lead-free cast bronze	ASTM B584 UNS C89836

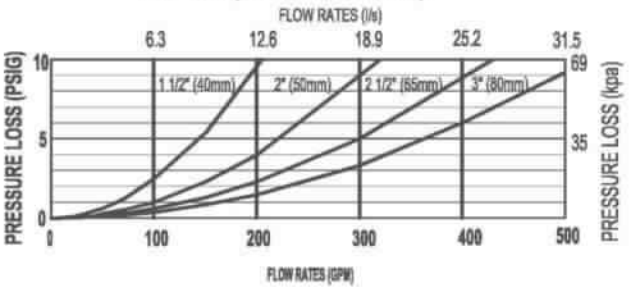
DIMENSIONS

Size	A (IPS)	B (IPS)	Plug NPT	A (CxC)	B (CxC)	Plug NPT
1/4"	3.21	2.17	3/8"			
3/8"	3.21	2.17	3/8"			
1/2"	3.21	2.17	3/8"	3.35	2.21	3/8"
3/4"	3.96	2.76	3/8"	4.32	2.68	3/8"
1"	4.53	2.95	1/2"	5.04	3.19	1/2"
1-1/4"	5.34	3.54	1/2"	5.91	3.70	1/2"
1-1/2"	6.22	3.86	1/2"	6.89	4.13	1/2"
2"	7.50	5.43	1/2"	8.62	5.12	1/2"
2-1/2"	9.06	5.91	1/2"	9.06	5.91	1/2"
3"	10.20	6.30	1/2"	10.20	6.30	1/2"

1/2" to 1 1/4" (STANDARD & METRIC)



1 1/2" to 3" (STANDARD & METRIC)



UPBA400/400S ¼"-2"

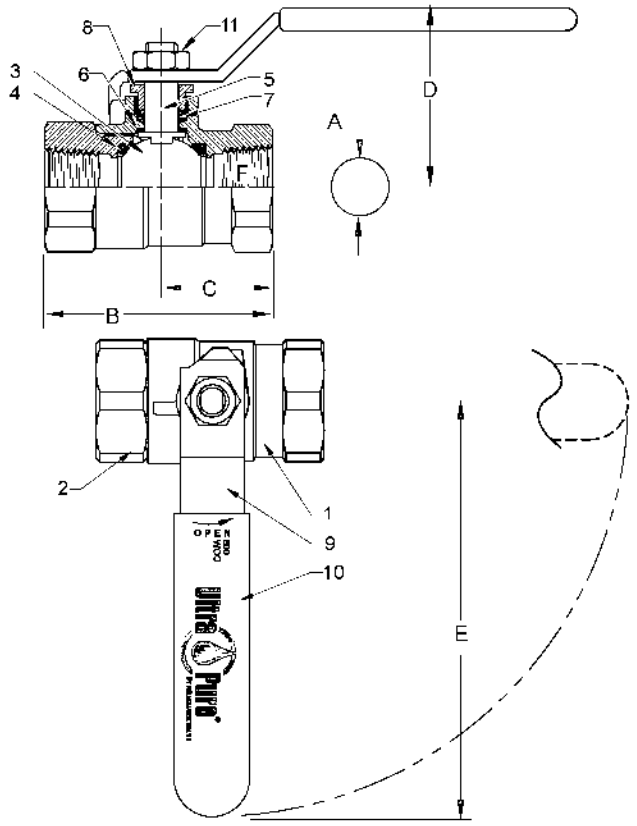
Tested and Certified by IAMPO R&T to NSF/ANSI 61 and NSF/ANSI 372 for Lead Free Compliance.

Bronze Ball Valve For Potable Water
Two Piece
Full Port
600 psig WOG
Threaded Ends
Blow-Out Proof Stem
Dimensions and Workmanship Conform to MSS SP-110

MATERIALS LIST

ITEM	PART	MATERIALS	ASTM SPEC.
1	Body	Cast Bronze	B584 C89833
2	Tailpiece	Cast Bronze	B584 C89833
3	Ball	Brass w/Hard Chrome Plating	B283 C27450
		316 Stainless Steel (1)	A276 S31600
4	Seat	RPTFE, 15% Glass Filled	Commercial
5	Stem	Brass	B21 C46400, H02
		316 Stainless Steel (1)	A276 S31600
6	Thrust Washer	RPTFE, 25% Glass Filled	Commercial
7	Packing	PTFE	Commercial
8	Packing Nut	Brass	B16 C36000
9	Handle	Steel w/Zinc Plating	Commercial
10	Hand Grip	Vinyl	Commercial
11	Handle Nut	Steel w/Zinc Plating	Commercial

(1) Ball and stem are stainless for UPBA400S



DIMENSIONS

	UNITS	1/4" DN10	3/8" DN10	1/2" DN15	3/4" DN20	1" DN25	1-1/4" DN32	1-1/2" DN40	2" DN50
A (DIA)	INCHES	0.38	0.38	0.50	0.76	1.06	1.31	1.56	2.00
	mm	10	10	13	19	27	33	40	51
B	INCHES	1.86	1.86	2.19	2.59	3.32	3.77	4.28	5.10
	mm	46	46	54	66	84	96	109	130
C	INCHES	1.00	1.00	1.10	1.30	1.59	1.81	2.06	2.37
	mm	25	25	27	33	40	46	52	60
D	INCHES	1.78	1.81	1.91	2.32	2.68	2.82	3.00	3.36
	mm	44	44	47	59	68	72	76	85
E	INCHES	3.82	3.82	3.82	4.55	6.33	6.33	6.33	7.19
	mm	94	94	94	116	161	161	161	183
F	THREAD SIZE	1/4" NPT	3/8"NPT	1/2" NPT	3/4" NPT	1"NPT	1-1/4" NPT	1-1/2" NPT	2" NPT
Cv		7	7	13	30	61	110	185	360

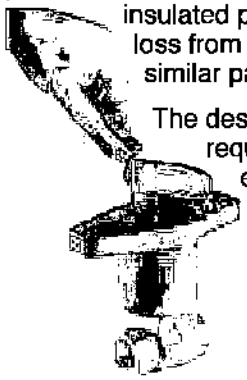
Note: DN (Diameter Nominal) = Metric equivalent size.

Note: Lead free refers to the wetted surface of the pipe, fittings and fixtures in potable water systems that have a weighted average lead content ≤0.25%. Source: California Health and Safety Code (116875).

OPTIONS

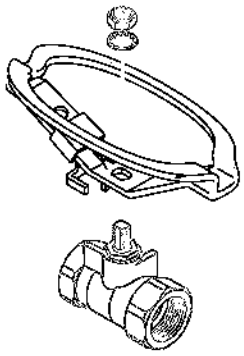
TIH THE INSULATOR/MS® Extension Handle

The THE INSULATOR/MS® extension handle is designed to prevent condensation and other extraneous moisture from entering the insulated piping system, while also minimizing thermal energy loss from the system via metal extension tubes, levers, and similar parts.

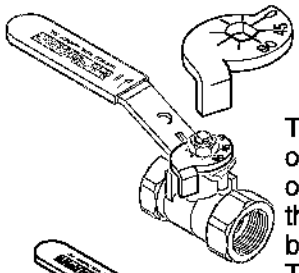


The design incorporates a unique memory stop feature that requires no disassembly or removal of the handle to engage and make adjustments.

LO Locking Oval Handle



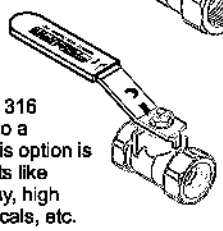
MS Memory Stop



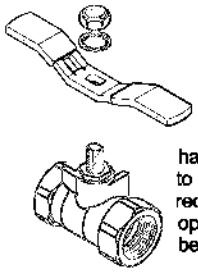
The "MS" Memory Stop offers the convenience of a preset stop when the valve is used in a balancing application. The memory stop can be set from the full closed position, to any preset opening point.

SH Stainless Steel Handle

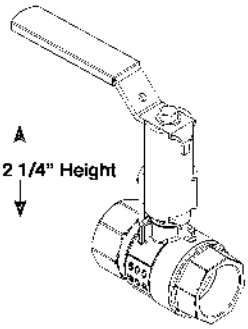
The "SH" handle option adds a 316 stainless steel handle and nut to a standard bronze ball valve. This option is intended for harsh environments like areas subject to salt water spray, high humidity, harsh cleaning chemicals, etc.



TH Tee Handle



Tee handles offer the same installation space savings as oval handles, with a slightly shorter end to end dimension. Tee handles require more handle force to operate, so accidental openings can be reduced.

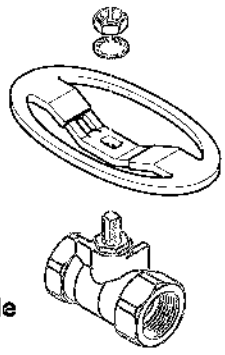


XM Extension Handle with Memory Stop

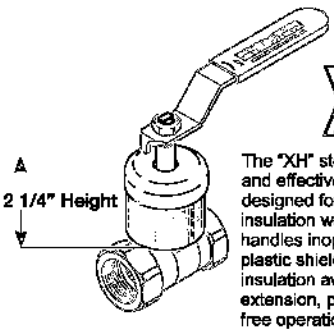
The "XM" stem extension is all-metallic with an adjustable memory stop. This option is designed for installations where pipe insulation would make standard handles inoperable. The adjustable memory stop allows the valve opening to be limited to a preset position. This option can be ordered with or without the memory stop.

OH & LO Milwaukee offers two styles of oval handles, standard oval and a padlocking oval design.

Oval handles can prevent accidental valve operations, since they have less projection than a lever handle, and require more turning force to operate. OSHA requires the use of oval handles in many installations for safety reasons. The locking handle design will accommodate a standard 5/16" pad-lock or other types of valve lockouts.



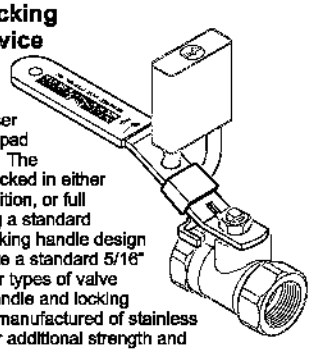
OH Oval Handle



XH Extension Stem

The "XH" stem extension is simple and effective design. This option is designed for installations where pipe insulation would make standard handles inoperable. The external plastic shield helps to keep the insulation away from the stem extension, providing years of trouble free operation.

LD Locking Device



The "LD" Locking Handle offers the end user the security of a pad lockable handle. The handle can be locked in either the full open position, or full closed by adding a standard padlock. The locking handle design will accommodate a standard 5/16" pad-lock or other types of valve lockouts. The handle and locking device are also manufactured of stainless steel material for additional strength and corrosion resistance.

Lead-Free Bronze Gate Valves

Features: Silicon Performance Bronze® Alloy • Screw-In Bonnet • Non-Rising Stem

Approvals: Conforms to MSS SP-139 • Solid Wedge • NSF/ANSI-61-8
Commercial Hot 180°F (includes annex F and G) and NSF/ANSI-372

NSF/ANSI 61
NSF/ANSI 372

Dezincification Resistant

5 year 125% warranty

Size range: 1/4" - 3"
Pressure rating: 300 PSI non-shock cold working pressure
Maximum pressure / temperature: 100 PSI at 300° F

Lead-free markings: Double oval in body casting, white handle and blue hang tag

MATERIAL LIST

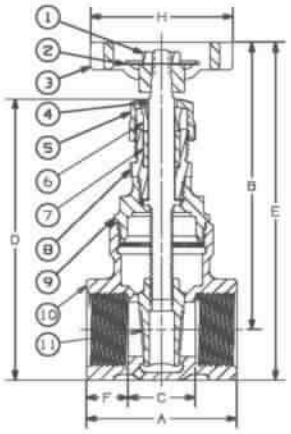
	PART	SPECIFICATION
1.	Handwheel Nut	300 Series Stainless Steel
2.	Identification Plate	Aluminum
3.	Handwheel	Malleable Iron ASTM A47 (T-113)
4.	Stem	ASTM B99 Alloy C65100
5.	Packing Nut	Bronze ASTM B62 or ASTM B584 Alloy C84400 or Brass ASTM B16
6.	Packing Gland	Bronze ASTM B62 or ASTM B584 Alloy C84400 or Brass ASTM B16
7.	Packing	Aramid Fibers with Graphite
8.	Stuffing Box	Silicon Bronze ASTM B584 Alloy C87850
9.	Bonnet	Silicon Bronze ASTM B584 Alloy C87850
10.	Body	Silicon Bronze ASTM B584 Alloy C87850
11.	Wedge	Silicon Bronze ASTM B584 Alloy C87850

T-113-LF
Threaded

S-113-LF
Solder

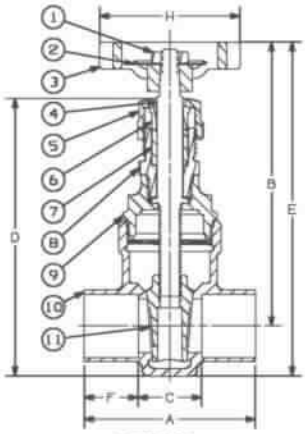
DIMENSIONS—WEIGHTS—QUANTITIES

SIZE		A		B		C		D		E		F		H		T-113-LF		Master
In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.	Ctn Qty.
1/4†	8	1.68	43	3.44	87	0.88	22	3.06	78	3.95	100	0.4	10	1.95	50	0.70	0.31	50
3/8†	10	1.68	43	3.44	87	0.84	21	3.95	100	3.95	100	0.42	11	1.95	50	0.67	0.30	50
1/2†	15	1.94	49	3.66	93	0.88	22	4.24	108	4.24	108	0.54	14	1.95	50	0.78	0.35	50
3/4	20	2.06	52	3.94	100	0.92	23	4.64	118	4.64	118	0.57	14	1.95	50	1.00	0.48	50
1	25	2.44	62	4.62	117	1.04	26	5.52	140	5.52	140	0.7	18	2.56	65	1.73	0.78	30
1-1/4	32	2.62	67	5.19	132	1.21	31	6.25	159	6.25	159	0.7	18	2.56	65	2.28	1.04	20
1-1/2	40	2.88	73	6.3	160	1.38	35	7.5	191	7.5	191	0.75	19	3.55	90	3.33	1.51	10
2	50	3.06	78	7.09	180	1.48	38	8.59	218	8.59	218	0.79	20	3.55	90	4.68	2.13	10
2-1/2	65	4.12	105	8.88	226	1.84	47	10.69	272	10.69	272	1.14	29	3.55	90	9.46	4.29	5
3	80	4.5	114	10.24	260	2.1	53	12.5	318	12.5	318	1.2	30	4.23	107	13.70	6.20	4



T-113-LF
NPT x NPT

SIZE		A		B		C		D		E		F		H		S-113-LF		Master
In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.	Ctn Qty.
1/2†	15	1.76	45	3.66	93	0.75	19	3.26	83	4.16	106	0.5	13	2.08	53	0.69	0.29	50
3/4	20	2.38	60	3.84	98	0.88	22	3.7	94	4.53	115	0.75	19	2.08	53	0.94	0.43	50
1	25	2.82	72	4.66	118	1	25	4.57	116	5.5	140	0.91	23	2.64	67	1.50	0.68	30
1-1/4	32	3.12	79	5.01	127	1.18	30	5.16	131	6.05	154	0.97	25	2.8	71	2.14	0.97	20
1-1/2	40	3.42	87	6.2	157	1.24	31	6	152	7.37	187	1.09	28	3.83	97	3.01	1.37	10
2	50	4	102	7.06	179	1.31	33	7.24	184	8.52	216	1.34	34	4.69	119	4.40	1.99	10



S-113-LF
C x C

†No packing gland, packing only in this size.

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

LEAD-FREE: Weighted average lead content ≤ 0.25%

TER-1 Thermal Expansion Relief Valve

25704LF

DESCRIPTION

The SharkBite TER-1 Thermal Expansion Relief Valve prevents excessive pressure building up in a closed loop plumbing system. The TER-1 combines a full port ball valve with a pressure relief valve and can be installed in place of an expansion tank.

The relief valve on the TER-1 is factory set to relief pressure at 125 psi. This valve is intended for use where supply line pressure does not exceed 200 psi when isolated, and is suited for either cold or hot (to 180°F) water service.

FEATURES AND BENEFITS

Instant push-fit connections for increased ease of use:
No soldering, glue or tools required to make connection.

Replace an expansion tank, shut-off valve, and fitting with one product:
Less joints and potential leak paths.

Certified to IGC 128, IAPMO/ANSI Z1157, NSF/ANSI/CAN 61, NSF/ANSI 372, and CSA B125.3 Listed by IAPMO and CSA.
Inspector friendly for peace of mind.

Found in the International Plumbing Code and Uniform Plumbing Code:
Can be installed in the water line without special support brackets.

Every valve is tested for performance prior to shipping:
Specify and install with confidence.

Assembled and tested in the USA:
Prepared in our manufacturing plant in Cullman, Alabama.

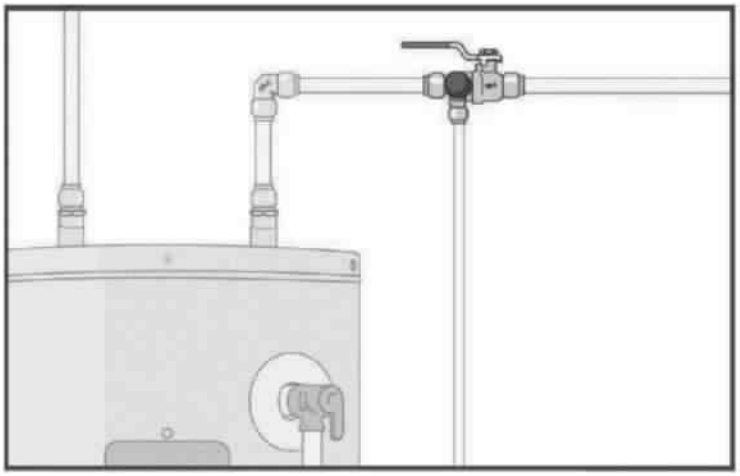
SPECIFICATION

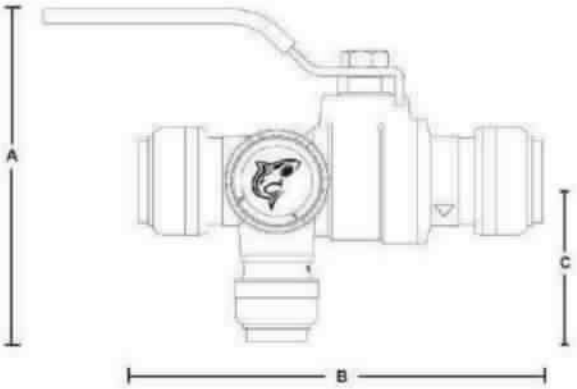
A thermal expansion control device shall be installed to relieve excess pressure in a closed loop water system. The valve shall be approved in accordance with IGC 128, CSA 125.3, and IAPMO/ANSI Z1157. The valve shall be certified to NSF/ANSI/CAN 61 and NSF/ANSI 372. The valve shall have a brass body with a relief valve twist knob with integral SharkBite push-to-connect ends. The valve shall be used on copper tubing, and CTS CPVC and PEX. The valve shall be a **TER-1 Thermal Expansion Relief Valve.**

TER-1 Thermal Expansion Relief Valve

TYPICAL INSTALLATION

The TER-1 is installed on the cold water inlet supply to the water heater with the orientation of the thermal expansion relief outlet connection horizontal or pointed downward to ensure the outlet drains dry. For additional information, reference the installation instructions.





A	3.93"
B	4.69"
C	1.93"

SPECIFICATION DATA

Performance:

Maximum inlet pressure	200 psi
Maximum temperature	200°F (93°C)
Service	Potable Water
Relief pressure	125 psi
Relief discharge connection	½"
Ball valve connections	¾"

TER-1 Valve Materials:

Body	Lead Free* DZR Brass
Ball seals	PTFE
Stem o-rings	NBR
Relief cartridge seat disc/diaphragm	Silicone

SharkBite® Materials:

O-ring	EPDM
Grab ring	Stainless steel
Tube support liner	Polysulfone

CERTIFICATIONS

Certified to IGC 128, IAPMO/ANSI Z1157, NSF/ANSI/CAN 61, NSF/ANSI 372, and CSA B125.3

Listed by IAPMO and CSA

The TER-1 is a thermal expansion control device. It is used to control thermal expansion and can be found in both the Uniform Plumbing Code (UPC) and the International Plumbing Code (IPC).

*For all models, surfaces that are in contact with consumable water contain less than 0.25% lead by weight.

For Health Hazard Applications

Job Name _____ Contractor _____

Job Location _____ Approval _____

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

Approval _____ Representative _____

LEAD FREE*

Series LF8

Hose Connection Vacuum Breakers

Size: ¾" hose thread

Series LF8 is a line of unique vacuum breakers specially made to permit the attachment of portable hoses to hose thread faucets. Designed to prevent the flow of contaminated water back into the potable water supply, these devices require no plumbing changes and screw directly onto sill cocks. The Series LF8 features Lead Free* construction to comply with Lead Free* installation requirements.

Series LF8 can be used on a wide variety of installations, such as service sinks, swimming pools, photo developing tanks, laundry tubs, wash racks, dairy barns, marinas and general outside gardening uses.

Features

- Copper silion alloy body (all models except 8P, which is plastic)
- Stainless steel working parts for longevity
- Durable rubber diaphragm and disc for consistent positive seating

Models

LF8A - Furnished with exclusive "Non-Removable" feature and standardly equipped to allow sill cock to be drained.

NOTICE

Device should only be installed on approved sill cocks containing at least four full threads. Non-removable once installed.

LF8 - Similar to the 8A except it is furnished without the "Non-Removable" or draining feature. Secured with Allen head set screw.

LF8B - Furnished with break-away set screw to provide a tamper-resistant installation. Standardly equipped to allow sill cock to be drained.

LFNF8 - Especially made for wall and yard hydrants. Permits manual draining for freezing conditions.

8P - Furnished with exclusive patented "Non-Removable" feature. Standardly equipped to allow sill cock to be drained. Constructed of durable, corrosion-resistant, reinforced thermoplastic. Tamper-proof feature.

LF8AC, LF8C or LF8BC - Same as above but furnished with chrome finish.

LF8FR - With freeze relief feature.

LF8A
Non-Removable Model

LF8

LFNF8
Permits Manual Drain

LF8B

8P
Tamper-Proof Feature

LF8FR

NOTICE

Series LF8 is tested and certified under ANSI A112.1.3 (ASSE 1011), which precludes use under continuous pressure.

This valve should only be used in areas where spillage of water will not cause damage.

Inlet Connection: ¾" standard female hose thread

Outlet Connection: ¾" standard male hose thread

Maximum Pressure: 125psi (8.6 bar)

Maximum Temperature: 180°F (82°C)

For backflow preventers for tub and shower hand spray sets, request literature ES-S8.

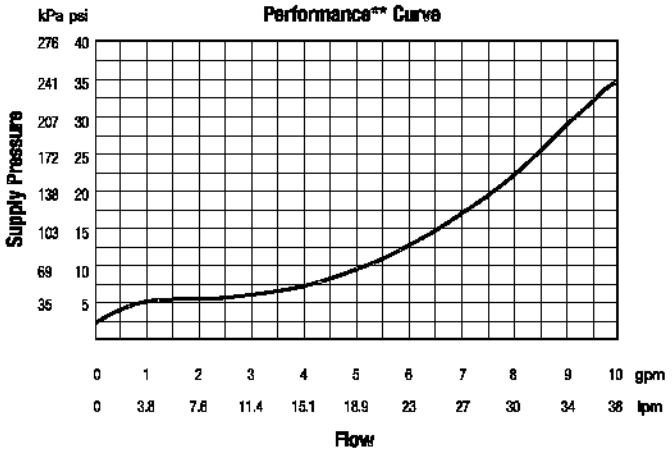
Specifications

A hose connection type anti-siphon vacuum breaker shall be installed where indicated on the plans to prevent the backsiphonage of contaminated water. Lead Free* hose connection vacuum breaker shall be constructed using Lead Free* materials. Lead Free vacuum breaker shall comply with state codes and standards, where applicable, requiring reduced lead content. This device is not to be used under continuous pressure or where there is a possibility that a backpressure condition may develop. This device shall meet the requirements of ANSI A112.1.3, ASSE Standard 1011. Vacuum breaker shall be a Watts Series LF8.

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

WATTS®

Capacity



**Performance as established by an independent testing laboratory.

Approvals

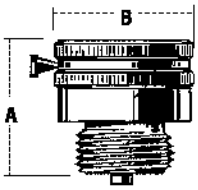
1011 B64.2

Series LF8, LF8A, LF8B, 8P, LF8FR and LFNF8 are listed by IAPMO.

NOTICE

Inquire with governing authorities for local installation requirements

Dimensions – Weights

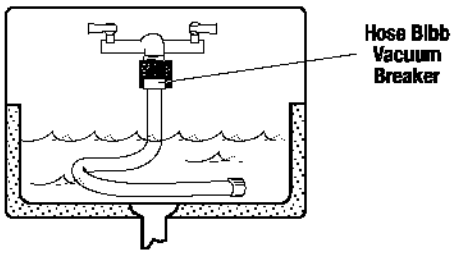


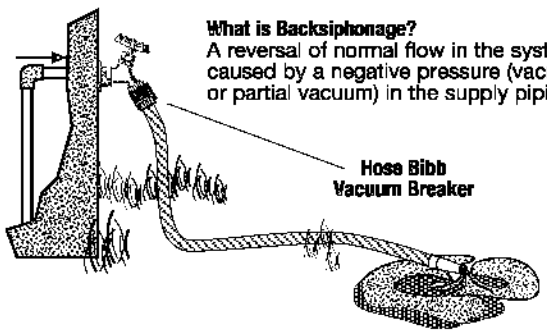
MODEL	SIZE	DIMENSIONS				WEIGHT	
		A		B			
	in.	in.	mm	in.	mm	oz.	gm.
LF8, LF8C, LF8B, LF8BC	¾ HT	1½	38	1⅜	35	4.0	113.4
LF8A, LF8AC	¾ HT	1½	38	1½	38	4.0	113.4
LFNF8	¾ HT	2	51	1½	38	5.3	151.2
8P	¾ HT	1¾	38	1⅜	35	1.5	42.5
LF8FR	¾ HT	1¾	38	1¾	38	7.0	200.0

Installations

For Inside or Outside Use

Installation - Inside Service Sink





What is Backsiphonage?
A reversal of normal flow in the system caused by a negative pressure (vacuum or partial vacuum) in the supply piping.

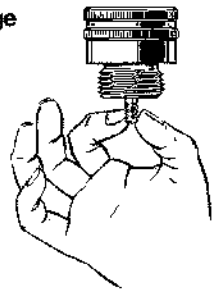
Drainage Features to Prevent Freezing

Models LF8A, LF8B, LF8FR and 8P hose connection vacuum breakers are constructed to allow sill cocks to be drained. Simply remove hose coupling and lightly pull knurled tip of stem at outlet of valve to allow drainage of collected water.

NOTICE

Do not use Models LF8, LF8A, LF8B, 8P, LF8FR Hose Bibb Vacuum Breakers on frost-free hydrants. Specify Model LFNF8.

Do not use where discharge of water is objectionable.



NOTICE

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

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

Engineering Specification

Job Name _____ Contractor _____

Job Location _____ Approval _____

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

Approval _____ Representative _____

LEAD FREE*

Series LF007

Double Check Valve Assemblies

½" – 3"

Series LF007 Double Check Valve assemblies are installed at referenced cross-connections to prevent the backflow of polluted water into the potable water supply. Only those cross-connections identified by local inspection authorities as non-health hazard are allowed the use of an approved double check valve assembly. The valve body is fused with ArmorTek™ technology to resist corrosion due to microbial induced corrosion (MIC) or exposed metal substrate.** The series features Lead Free* construction to comply with Lead Free* installation requirements. Check with local authority having jurisdiction regarding vertical orientation, frequency of testing, or other installation requirements.

¾" LF007M3QT

LF007-NRS-IOT

Features

- Modular, compact design concept to facilitate maintenance and assembly by retaining the spring load
- Advanced ArmorTek™ coating technology to resist corrosion of internals**
- Lead Free* cast copper silicon alloy body construction — ½" to 2"
- Fused epoxy coated cast iron body — 2½" to 3"
- Top-mounted Lead Free* ball valve test cocks
- Replaceable seats and seat discs
- Easier maintenance through a single, top-entry cover
- No special tools required for servicing
- Tee handles — ½" to 1"
- Low pressure drop

Specification

A Double Check Valve Assembly shall be installed at each noted location. The assembly shall consist of two positive seating check modules with captured springs and rubber seat discs. The check module seats and seat discs shall be replaceable. Service of all internal components shall be through a single access cover secured with stainless steel bolts. The Double Check Valve Assemblies shall be constructed using Lead Free* cast copper silicon alloy. Lead Free* Double Check Valve Assemblies shall comply with state codes and standards, where applicable, requiring reduced lead content. The assembly shall also include two resilient seated isolation valves; four top mounted, resilient seated test cocks. The assembly shall meet the requirements of ASSE Standard 1015 and AWWA Standard C510. The valve body shall utilize a coating system with built in electrochemical corrosion inhibitor and microbial inhibitor.** Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California. Assembly shall be a Watts Series LF007.

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

** Armortek coating applies to the 2½" and 3" models only.

NOTICE

For IOT models, an add-on monitoring connection kit is required to collect psi measurements from the integrated pressure sensors. Without the connection kit, the pressure sensors are passive components and will not communicate with any other device. For BMS only. (The connection kit and pressure sensors are also available for existing installations. For more information, download RP-IS-007.)

NOTICE

Use of integrated pressure sensors on and monitoring connection kit with IOT models does not remove the need to comply with all required instructions, codes, and regulations related to installation, operation, and maintenance of the backflow preventer.

Watts® is not responsible for data transmission failures due to power issues.

NOTICE

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

Inquire with governing authorities for local installation requirements.

WATTS®

Model/Option

Prefix:

U – Union connections

Suffix:

½" – 2"

S – Copper silicon alloy strainer

LF – Without shutoff valves

W/Press* – Press inlet x press outlet

2½" – 3"

NRS – Non-rising stem resilient seated gate valves

OSY – UL Classified and FM Approved outside stem and yoke resilient seated gate valves

LF – Without shutoff valves

IOT – With pressure-sensing IoT test cocks and NRS gate valves

Materials

Check Valve Body: Lead Free* cast copper silicon alloy (½" to 2"); cast iron (2½" to 3")

Check Module: Captured spring and rubber seat disc

Access cover bolts: Stainless steel

Coating technology: Armortek (2½" and 3" only)

Pressure — Temperature

½" – 2"

Temperature Range: 33°F – 180°F (0.5°C – 82°C)

Maximum Working Pressure: 175 psi (12.1 bar)

2½" – 3"

Temperature Range: 33°F – 110°F (0.5°C – 43°C) continuous, 140°F (60°C) intermittent

Maximum Working Pressure: 175 psi (12.1 bar)

Standards

ASSE Standard 1015, AWWA Standard C510

IAPMO PS31, CSA B64.5

Approvals

USC-FCCCHR

† ASSE, AWWA, IAPMO, CSA, UPC

▲ Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California

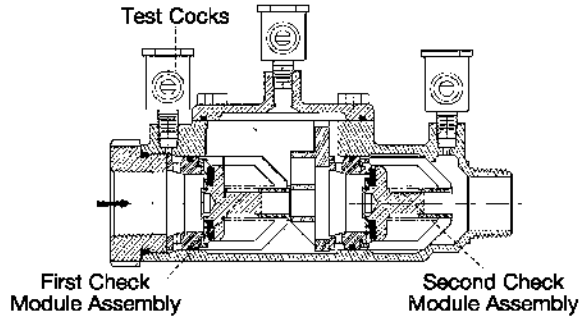
• Models with suffix LF and suffix S not listed

UL Classified without shutoff valves only (¾" to 2", except 007M3LF)

◆ UL Classified with OSY gate valves (2½" and 3" horizontal only)

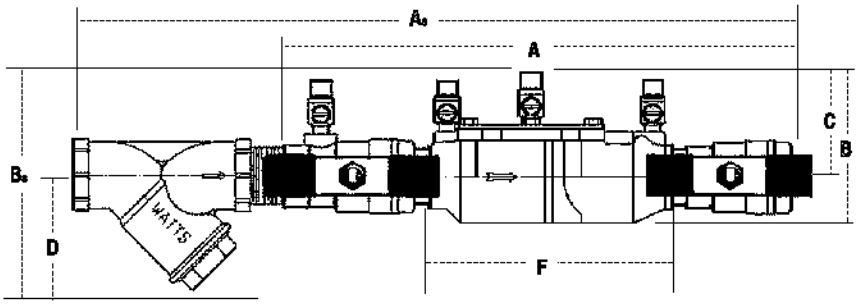
▼ Lead Free* ½" to 2" models with strainers

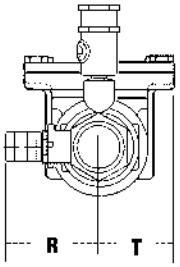
Horizontal and vertical "flow up" approval on all sizes



Dimensions – Weights

½" – 2"





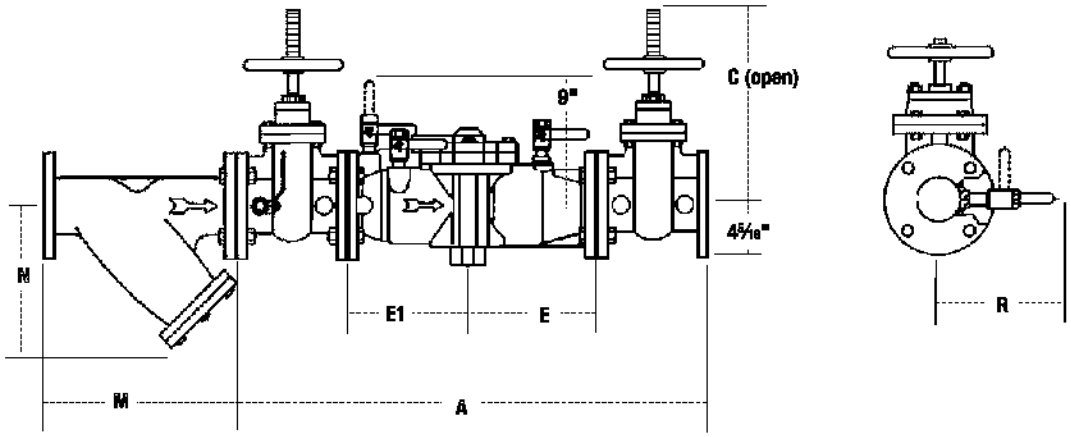
Subscript 'S' = strainer model

MODEL	SIZE	DIMENSIONS																WEIGHT	
		A		B		C		D		F		G		R		T			
								.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
†▲▼ LF007QT	½	10	254	4⅝	117	2⁷⁄₁₆	62	—	—	5	127	3⅜	85	2⁵⁄₁₆	59	2¹⁄₁₆	52	4.5	2
†▲▼ LF007M3QT	¾	11⅛	282	4	102	3⅛	79	—	—	6³⁄₁₆	157	3⁷⁄₁₆	87	2⅛	54	¹⁵⁄₁₆	33	5	2.3
†▲▼ LF007M1QT	1	13¼	337	5⅛	130	4	102	—	—	7½	191	3⅜	85	1¹¹⁄₁₆	43	1¹¹⁄₁₆	43	12	5.4
†▲▼ LF007M2QT	1¼	16⅜	416	5	127	3⁹⁄₁₆	84	—	—	9½	241	5	127	3	76	2	50	15	6.8
†▲▼ LF007M2QT	1½	16¾	425	4⅞	124	3½	89	—	—	9¾	248	5¹³⁄₁₆	148	3⅛	79	2¹¹⁄₁₆	68	15.9	7.2
†▲▼ LF007M1QT	2	19½	495	6¼	159	4	102	—	—	13⅜	340	6⅛	156	3⁷⁄₁₆	87	2¹¹⁄₁₆	68	25.7	11.7
▼ LF007QT-S	½	13	330	6	152	2⁷⁄₁₆	62	3	76	5	127	3⅜	85	2⁵⁄₁₆	59	2¹⁄₁₆	52	5.5	2.5
•▼ LF007M3QT-S	¾	14½	368	6⅛	156	3⅛	79	3	76	6³⁄₁₆	157	3⁷⁄₁₆	87	2⅛	54	¹⁵⁄₁₆	33	6.7	3.1
•▼ LF007M1QT-S	1	17¹⁵⁄₁₆	456	7¾	197	4	102	3¼	83	7½	191	3⅜	85	1¹¹⁄₁₆	43	1¹¹⁄₁₆	43	14	6.4
•▼ LF007M2QT-S	1¼	21½	546	7¹⁄₁₆	179	3⁹⁄₁₆	84	3½	83	9½	241	5	127	3	76	2	50	19	8.6
•▼ LF007M2QT-S	1½	21¾	552	7¹⁄₁₆	179	3½	89	3¾	95	9¾	248	5¹³⁄₁₆	148	3⅛	79	2¹¹⁄₁₆	68	19.6	8.9
•▼ LF007M1QT-S	2	25¾	654	8¾	222	4	102	4	102	13⅜	340	6⅛	156	3⁷⁄₁₆	87	2¹¹⁄₁₆	68	33.5	15.2

* Viega ProPress® connections are optional factory-installed fitting on each end of the approved/certified assembly.

Dimensions – Weights

2½" – 3"



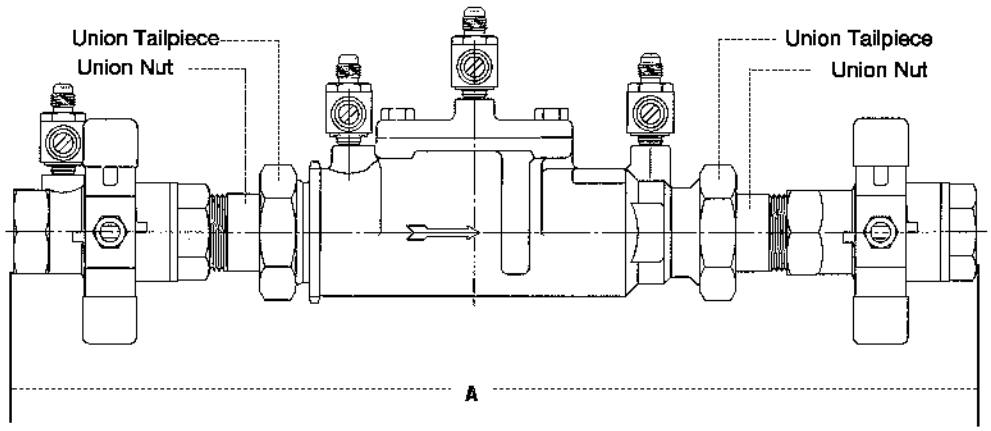
MODEL	SIZE	DIMENSIONS								WEIGHT	
		A		B		E, E1		R			
	in.	in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
▲ LF007-NRS	2½	33⅛	841	9⅜	238	9⅛	230	8¾	222	155	70
▲◆ LF007-OSY	2½	33⅛	841	16⅜	416	9⅛	230	8¾	222	158	72
▲ LF007-NRS	3	34¼	870	10¼	260	9⅛	230	8¾	222	185	84
▲◆ LF007-OSY	3	34¼	870	18⅞	479	9⅛	230	8¾	222	185	84

Strainer Dimensions

SIZE					WEIGHT	
	M		N			
in.	in.	mm	in.	mm	lb	kg
2½	10	254	6½	165	28	13
3	10⅛	267	7	178	34	15

LFU007

½" – 2"



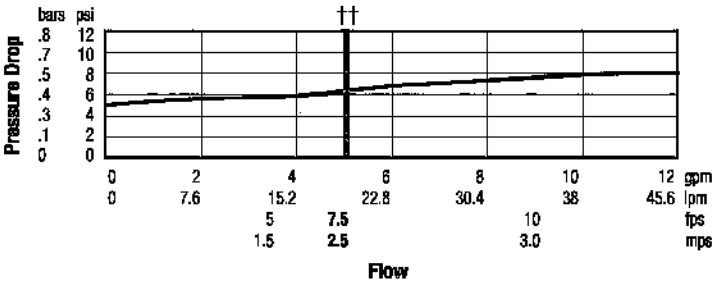
MODEL	SIZE	DIMENSIONS	
		A	
	in.	in.	mm
LFU007QT	½	12¹³⁄₁₆	326
LFU007M2QT	¾	13¹³⁄₁₆	350
LFU007M2QT	1	16⅝	422
LFU007M2QT	1¼	20¾	527
LFU007M2QT	1½	21½	546
LFU007M1QT	2	24½	622

Capacity

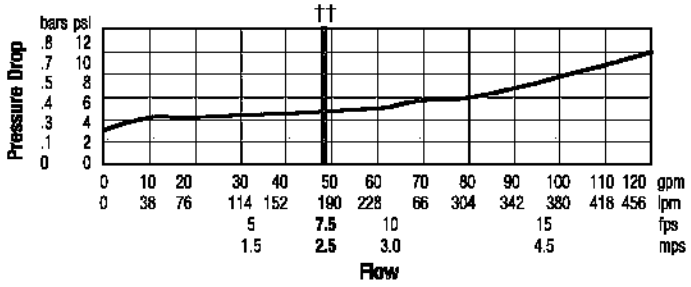
As compiled from documented Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California lab tests.

†† Typical maximum system flow rate (7.5 ft/sec, 2.3 m/sec)
** UL rated flow

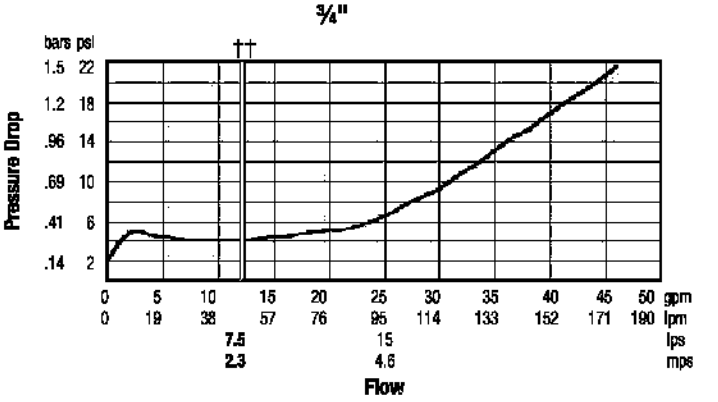
½"



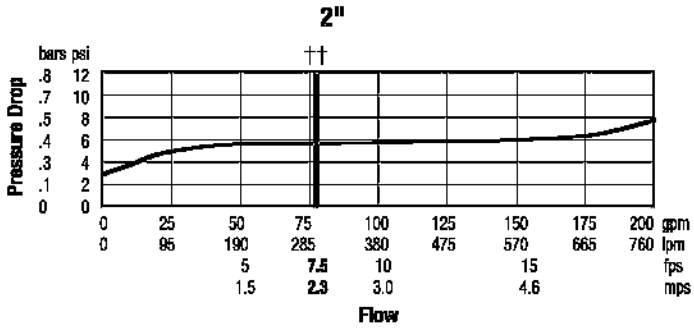
1½"



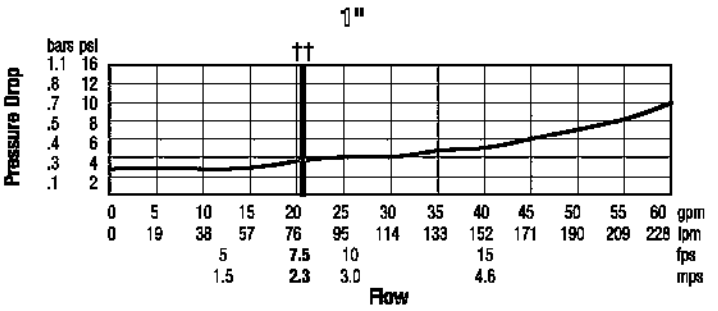
¾"



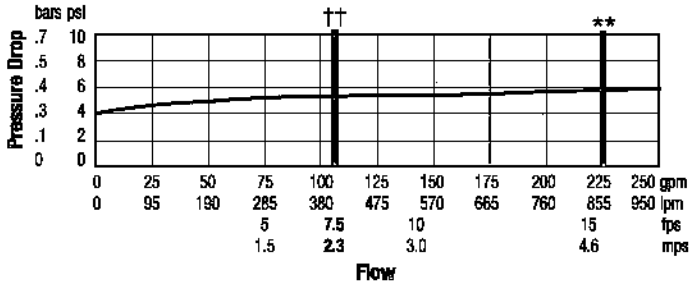
2"



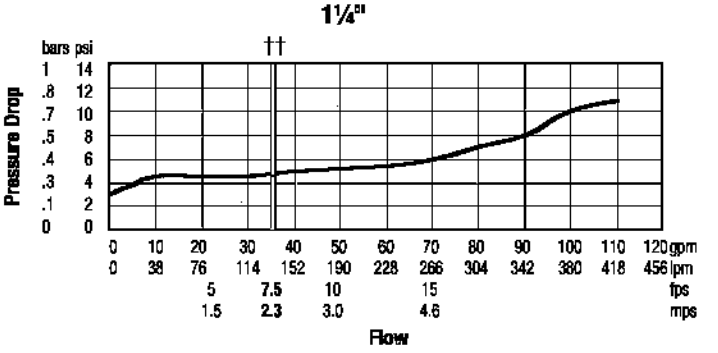
1"



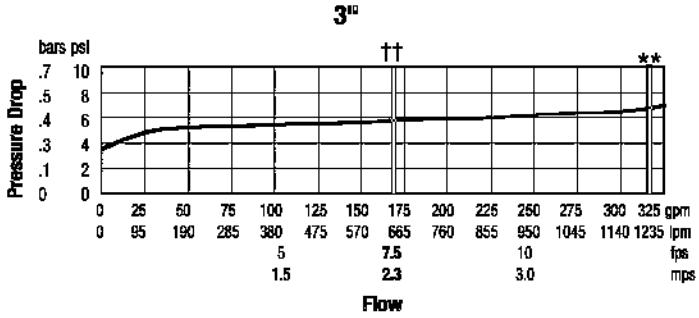
2½"



1¼"



3"



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Engineering Specification

Job Name _____ Contractor _____

Job Location _____ Approval _____

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

Approval _____ Representative _____

LEAD FREE*

Series LF009, LF009-FS

Reduced Pressure Zone Assemblies

¼" – 3"

Series LF009 and LF009-FS Reduced Pressure Zone Assemblies are designed to protect potable water supplies in accordance with national plumbing codes and water authority requirements. These series are used in a variety of installations, including the prevention of health hazard cross-connections in piping systems or for containment at the service line entrance. They are also used in irrigation systems, boiler feed, water lines, and other installations requiring maximum protection. The body construction is fused with ArmorTek™ coating technology to resist corrosion due to microbial induced corrosion (MIC) or exposed metal substrate.* The series also features Lead Free* construction to comply with Lead Free* installation requirements.

Both series feature two in-line, independent check valves, captured springs, and replaceable check seats with an intermediate relief valve. Its compact modular design facilitates easy maintenance and assembly access. Sizes ¼" to 1" shutoffs have tee handles.

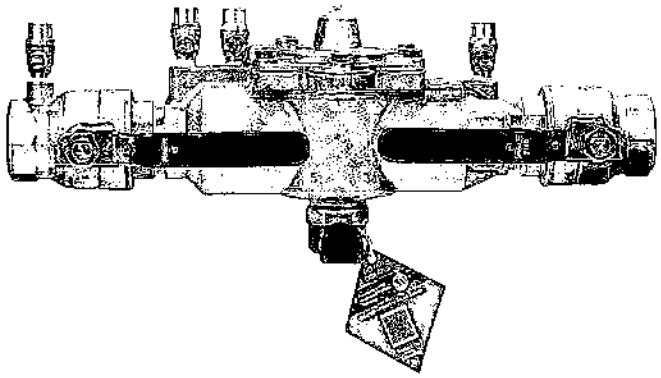
Series LF009-FS assemblies of sizes ½" to 3" include an integrated flood sensor to detect excessive water discharges from the relief valve. The flood sensor relays a signal that triggers notification to qualified service personnel who can take corrective action, thus avoiding the possibility of ruinous flooding and costly damage.

NOTICE

An add-on connection kit is required to activate the integrated flood sensor. Without the connection kit, the flood sensor is a passive component and will not communicate with any other device. (For more information, download RP-IS-009/009-FS.)

Features

- Single access cover and modular check construction for ease of maintenance
- Top entry to all internals for immediate accessibility
- Captured springs for safe maintenance
- Internal relief valve for reduced installation clearances
- Replaceable seats for economical repair
- ArmorTek™ coating technology to resist internal corrosion†
- Lead Free* cast copper silicon alloy body construction (¼" – 2")



LF009M2-QT-FS

- Fused epoxy coated cast iron body (2½" – 3")
- Ball valve test cocks — screwdriver slotted (¼" – 2")
- Large body passages provides low pressure drop
- Compact, space saving design
- No special tools required for servicing
- Integrated sensor for flood detection (½" – 3")
- Flood alert feature activated with add-on sensor connection kit, compatible with BMS and cellular communication

NOTICE

Use of the integrated flood sensor does not replicate the need to comply with all required instructions, codes, and regulations related to installation, operation, and maintenance of this product, including the need to provide proper drainage in the event of a discharge.

Watts® is not responsible for the failure of alerts due to connectivity or power issues.

NOTICE

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

Inquire with governing authorities for local installation requirements.

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

†Amortek coating applied to the 2½" and 3" models only.

WATTS®

Specification

A Reduced Pressure Zone Assembly shall be installed at each potential health hazard location to prevent backflow due to backsiphonage and/or backpressure. The assembly shall consist of an internal pressure differential relief valve located in a zone between two positive seating check modules with captured springs and silicone seat discs. Seats and seat discs shall be replaceable in both check modules and the relief valve. There shall be no threads or screws in the waterway exposed to line fluids. Service of all internal components shall be through a single access cover secured with stainless steel bolts. Body and shutoffs shall be constructed using Lead Free* cast copper silicon alloy materials. Lead Free* reduced pressure zone assembly shall comply with state codes and standards, where applicable, requiring reduced lead content.

The assembly shall also include two resilient seated isolation valves, four resilient seated test cocks, and an air gap drain fitting. The valve body shall utilize a coating system with built-in electrochemical corrosion inhibitor and microbial inhibitor.† The assembly shall meet the requirements of USC; ASSE Std. 1013; AWWA Std. C511; CSA B64.4. Shall be a Watts Series LF009, and shall include an integrated sensor for flood detection on sizes ½" to 3".

Materials

¼" – 2"

Lead Free* cast copper silicon alloy body construction, silicone rubber disc material in the first and second check plus the relief valve. Replaceable polymer check seats for first and second checks. Removable relief valve seats. Stainless steel cover bolts.

Standardly furnished with NPT body connections. Model LF009QT furnished with quarter-turn, full port, resilient seated, Lead Free* cast copper silicon alloy body ball valve shutoffs.

2½" – 3"

- FDA-approved epoxy-coated cast iron unibody with plastic seats
- Relief valve with stainless steel seat and trim
- Lead Free* cast copper silicon alloy body ball valve test cocks

Model/Option

¼" – 2"

Prefix:

U – Union connections

Suffix:

FS – Integrated sensor for flood detection (½" – 2")
LF – Without shutoff valves
PC – Internal polymer coating
Press** – Press inlet x press outlet (½" – 2")
QT – Quarter-turn ball valves
S – Strainer

2½" – 3"

Suffix:

FS – Integrated sensor for flood detection
LF – Without shutoff valves
NRS – Non-rising stem resilient seated gate valves
OSY – UL/FM outside stem and yoke resilient seated gate valves
S-FDA – FDA epoxy coated strainer

NOTE: The installation of a drain line is recommended. When installing a drain line, an air gap is necessary. (For more information download ES-AG/EL/TC at watts.com.)

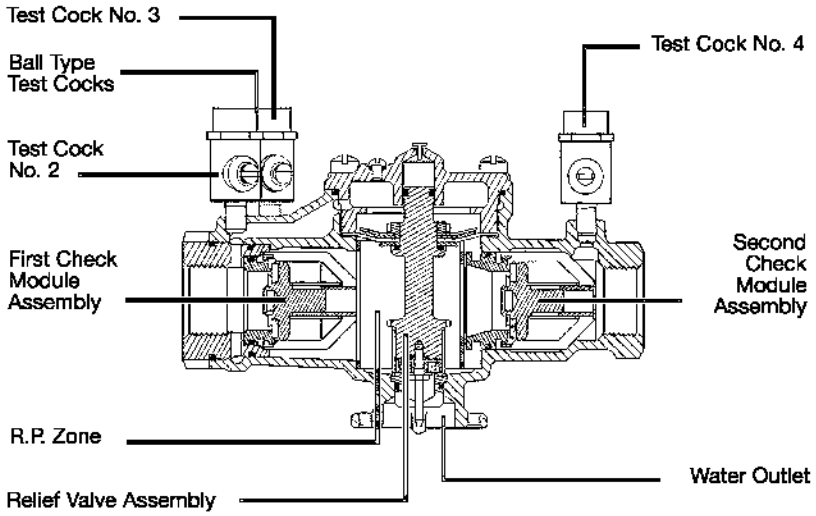
Pressure – Temperature

¼" – 2"

Suitable for supply pressure up to 175 psi (12.1 bar)
Water temperature: 33°F – 180°F (0.5° – 82°C)

2½" – 3"

Suitable for supply pressures up to 175 psi (12.1 bar)
Water temperature: 110°F (43°C) continuous; 140°F (60°C) intermittent



** Viega ProPress® connections are optional factory-installed fitting on each end of the approved/certified assembly.

Standards

USC
ASSE No. 1013
AWWA C511
CSA B64.4
IAPMO File No. 1563

Approvals

USC-FCCCHR

ASSE, AWWA, CSA, IAPMO

Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California

Approval models NRS, OSY, PC, QT

UL Classified
2½" – 3" with OSY gate valves

¾" – 2" without shutoff valves (-LF), except LF009M3LF

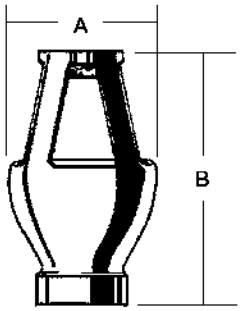
Insulated Enclosure

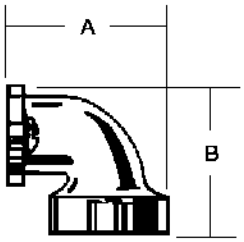
The WattsBox insulated enclosure is available for Series LF009/ LF009-FS. For more information download ES-WB at watts.com.

Air Gaps and Elbows

MODEL		DRAIN OUTLET[1]		DIMENSIONS				WEIGHT	
				A		B			
	For 909, 009, and 993 sizes	in.	mm	in.	mm	in.	mm	lb	kg
909AGA	¼"–½" 009, ¾" 009M2/M3	½	13	2⅜	60	3⅛	79	0.625	0.28
909AGC	¾"–1" 009/909, 1"–1½" 009M2	1	25	3¼	83	4⅞	124	1.5	0.68
909AGF	1¼"–2" 009M1, 1¼"–3" 009/909, 2" 009M2, 4"–6" 993	2	51	4⅜	111	6¾	171	3.25	1.47
909AGK	4"–6" 909, 8"–10" 909M1	3	76	6⅜	162	9⅝	244	6.25	2.83
909AGM	8"–10" 909	4	102	7⅜	187	11¼	286	15.5	7.03
909ELA	¼"–½" 009, ¾" 009M2/M3	–	–	–	–	–	–	–	–
909ELC	¾"–1" 009/909	–	–	2⅜	60	2⅜	60	0.38	0.17
909ELF*	1¼"-2" 009M1, 1¼"–2" 009/909, 2" 009M2, 4"–6" 993	–	–	3⅝	92	3⅝	92	2	0.91
909ELH* Vertical	2½"–3" 009/909	–	–	–	–	–	–	–	–

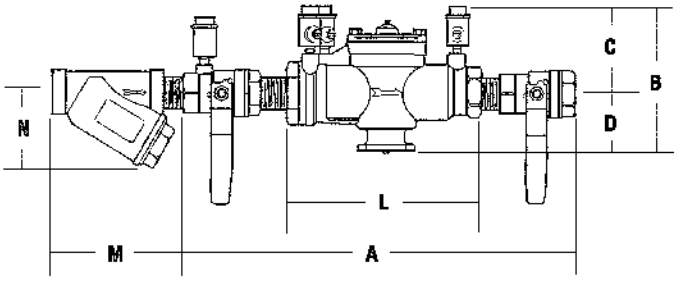
*Epoxy coated



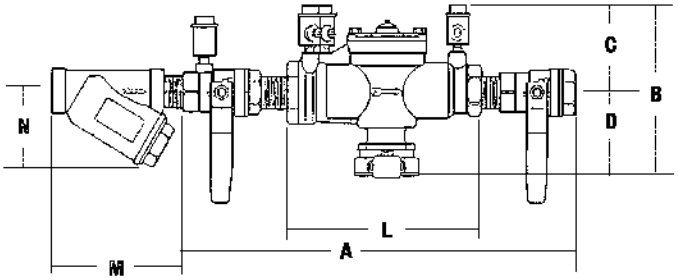


Dimensions – Weight

¼" – ⅜"

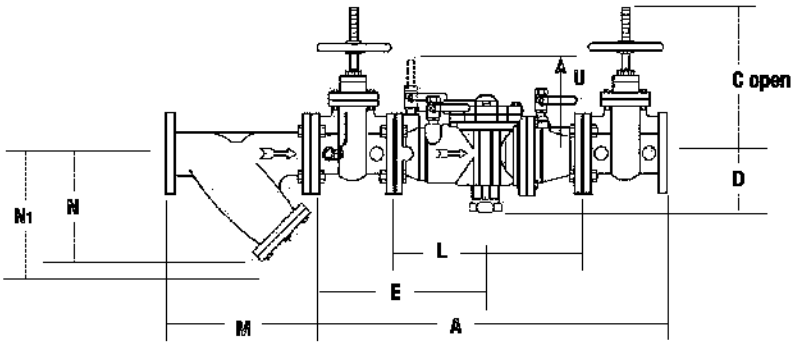


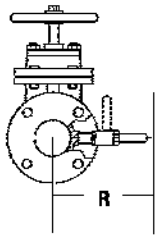
½" – 2"

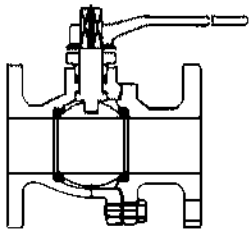


SIZE	DIMENSIONS (APPROX.)														WEIGHT	
	A		B		C		D		L		M		N			
in.	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in	mm	in	mm	lb	kg
¼	10	250	4⅝	117	3⅜	86	1¼	32	5½	140	2⅜	60	2½	64	5	2
⅜	10	250	4⅝	117	3⅜	86	1¼	32	5½	140	2⅜	60	2½	64	5	2
½	10	250	5⅞	149	3⅜	86	2½	64	5½	140	2¾	70	2¼	57	5	2
¾	10¾	273	6¼	159	3½	89	2¾	70	6¾	171	3 3/16	81	2¾	70	6	3
1	14½	368	6¼	159	3	76	3¼	83	9½	241	3¾	95	3	76	12	5
1¼	17⅜	441	6¾	169	3½	89	3¼	83	11⅜	289	4 7/16	113	3½	89	15	6
1½	17⅞	454	6¾	169	3½	89	3¼	83	11⅛	283	4⅞	124	4	102	16	7
2	21⅜	543	8¾	222	4½	114	4¼	108	13½	343	5 5/16	151	5	127	30	13

2½" – 3"







Watts G-4000 Series
QT – Ball Valves

STRAINER SIZE		DIMENSIONS (APPROX.)						WEIGHT	
		M		N		N1†			
in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
2½	65	10	254	6½	165	9¾	248	28	12.7
3	80	10⅛	257	7	178	10	254	34	15.4

†Clearance for servicing

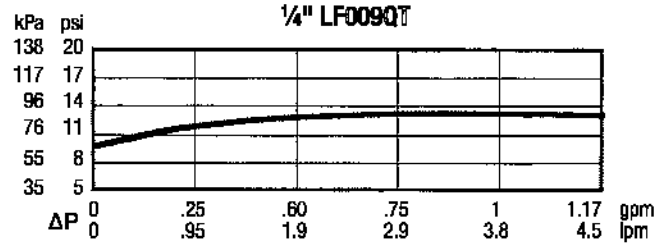
MODEL	SIZE	DIMENSIONS (APPROX.)														WEIGHT	
		A		C		D		E		L		R		U			
	in.	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
LF009LF	2½	—	—	—	—	5⅝	143	—	—	18⅛	460	—	—	10⅝	270	76	34.5
LF009QSY	2½	33¼	845	15⅞	403	5⅝	143	16⅜	416	18⅛	460	7¾	197	10⅝	270	166	75.3
LF009NRS	2½	33¼	845	11⅜	289	5⅝	143	16⅜	416	18⅛	460	7¾	197	10⅝	270	161	73.0
LF009LF	3	—	—	—	—	5⅝	143	—	—	18⅛	460	—	—	10⅝	270	76	34.5
LF009QSY	3	34¼	870	18½	470	5⅝	143	16⅝	422	18⅛	460	8¾	222	10⅝	270	198	89.8
LF009NRS	3	34¼	870	12¾	324	5⅝	143	16⅝	422	18⅛	460	8¾	222	10⅝	270	191	86.6

Capacity

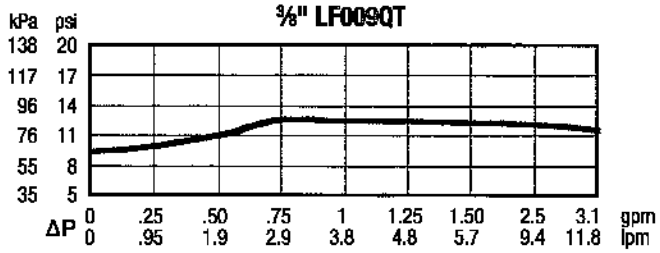
Performance as established by an independent testing laboratory.

The asterisk (*) indicates the typical maximum system flow rate (7.5 ft/sec, 2.3 m/sec).

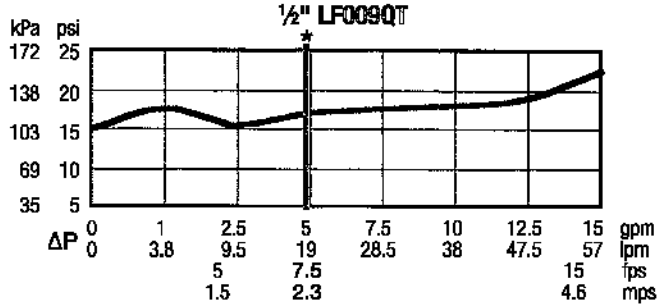
¼" LF009QT



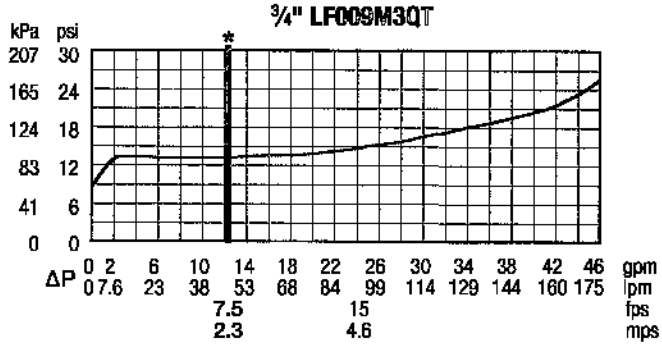
⅜" LF009QT



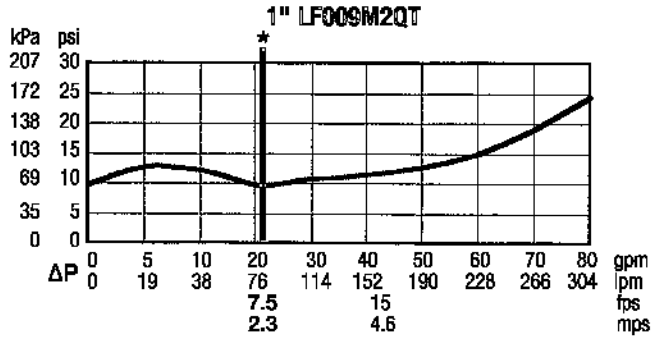
½" LF009QT



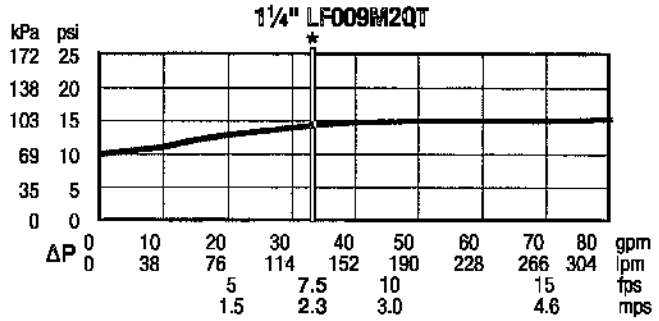
¾" LF009M3QT



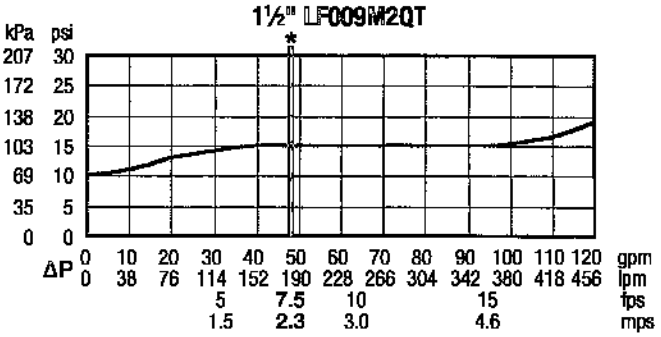
1" LF009M2QT



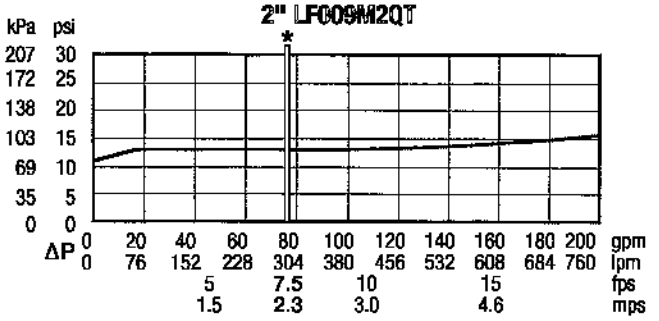
1¼" LF009M2QT



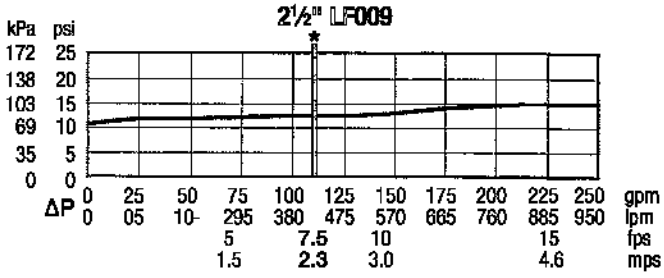
1½" LF009M2QT



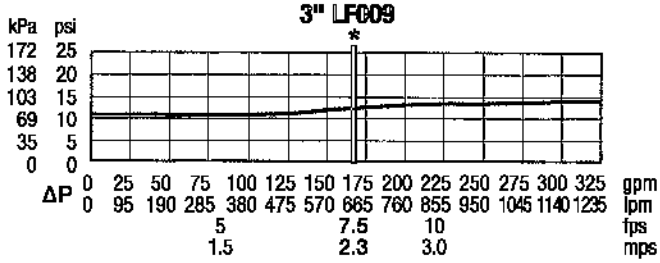
2" LF009M2QT



2½" LF009



3" LF009



WATTS®

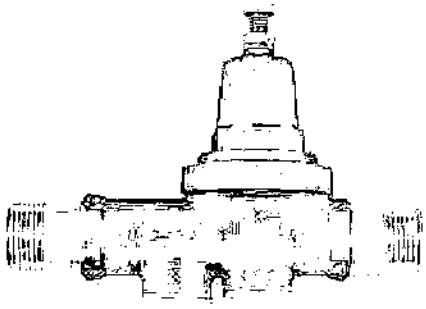
USA: T: (978) 689-6066 • Watts.com
Canada: T: (888) 208-8927 • Watts.ca
Latin America: T: (52) 55-4122-0138 • Watts.com

Model 600XLDM

Water Pressure Reducing Valve with Integral By-pass Check Valve, Male Meter Connection and Strainer

Application

Ideal for use where Lead-Free valves are required. Designed for installation on potable water lines to reduce high inlet pressure to a lower outlet pressure. The double male meter thread connections are specifically designed for meter setter applications. The direct acting integral by-pass design prevents buildup of excessive system pressure caused by thermal expansion. The balanced piston design enables the regulator to react in a smooth and responsive manner to changes in system flow demand, while at the same time, providing protection from inlet pressure changes. Furnished with sealed cage and stainless steel adjustment bolt.



Standards Compliance

- ASSE® Listed 1003
- IAPMO® Listed
- CSA® Certified
- City of Los Angeles Approved
- Certified to NSF/ANSI 372* by IAPMO R&T

*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

Materials

Main valve body	Low Lead Cast Bronze ASTM B 584
Access covers	Low Lead Brass
Fasteners	300 Series Stainless Steel
Stem & plunger	Low Lead Brass
Elastomers	Buna Nitrile, FDA EPDM, FDA
Cap gaskets	Delrin™ 500 Acetal, NSF Listed
Strainer screen	300 Series Stainless Steel

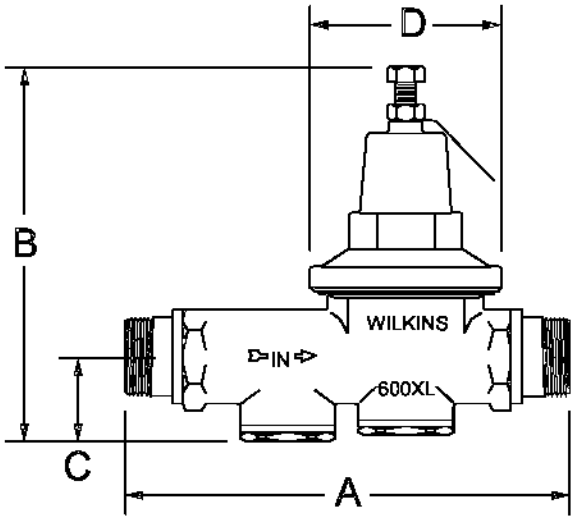
Options

☐ HR - High Range 75 psi to 125 psi Factory set @ 85 psi
☐ DM2 - 9 1/2" Lay Length, 1" 600XL only.

Features

Sizes: 3/4", 1"
Standard with Sealed Cage Bell Housing and stainless steel adjustment screw

Maximum working water pressure	300 psi
Maximum working water temperature	140°F
Hydrostatic test pressure	300 psi
End connections Threaded	ANSI B1.20.1 Male Meter 5/8x3/4



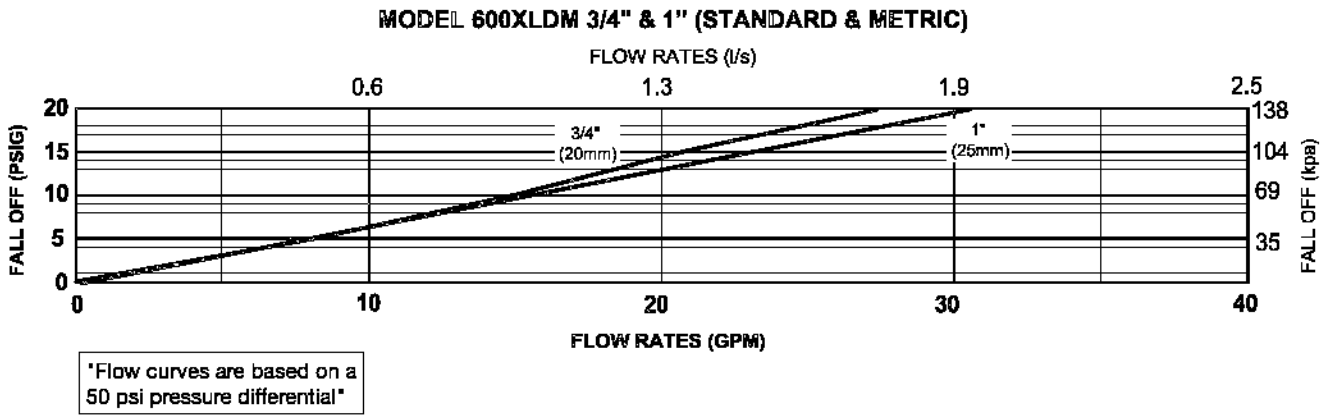
Dimensions & Weights (do not include pkg.)

METER THREAD	DIMENSIONS (approximate)								WEIGHT	
	A		B		C		D			
	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg.
3/4"	7 1/2	191	5 1/2	140	1 1/4	32	2 3/4	70	3.5	1.58
1" DM	7 1/2	191	7 1/4	184	2	51	35/16	84	6.0	2.72
1" DM2	9 1/2	241	7 1/4	184	2	51	35/16	84	6.5	2.95

Zurn Industries, LLC | Wilkins
1747 Commerce Way, Paso Robles, CA U.S.A. 93446 Ph. 855-663-9876, Fax 805-238-5766
In Canada | **Zurn Industries Limited**
3544 Nashua Drive, Mississauga, Ontario L4V 1L2 Ph. 905-405-8272, Fax 905-405-1292
www.zurn.com

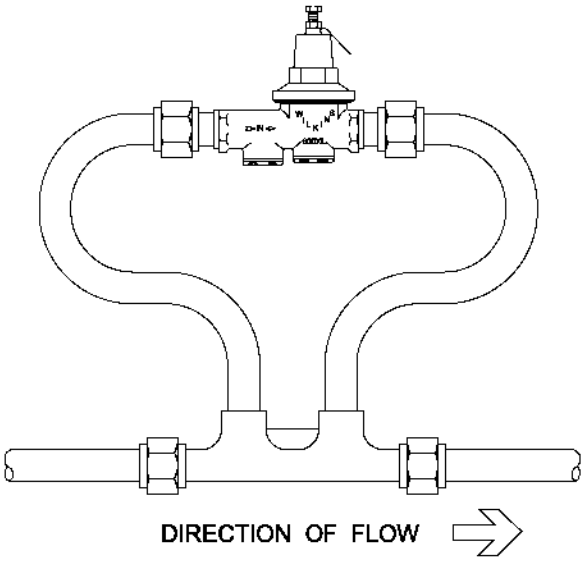
Rev. C
Date: 6/15
Document No. REG-600XLDM
Product No. Model 600XLDM

Flow Characteristics



Typical Installation

Local codes shall govern installation requirements. Unless otherwise specified, the assembly shall be mounted in accordance with the latest edition of the Uniform Plumbing Code. The Model 600XLDM may be installed in any position. Multiple installations are recommend for wide demand variations or where the desired pressure reduction is more than 4 to 1 (i.e.: 200 psi inlet reduced to 50 psi outlet). **Caution:** Anytime a reducing valve is adjusted, a pressure gauge must be used downstream to verify correct pressure setting. Do not bottom adjustment bolt on bell housing.



Meter Setter Installation

Specifications

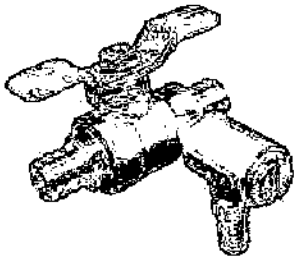
The Pressure Reducing Valve shall be certified to NSF/ANSI 372, consist of a low lead bronze body and bronze bell housing, shall have a separate access cover for the plunger and strainer screen and shall have a bolt to adjust the downstream pressure. The Pressure Reducing Valve shall be of the balanced piston design and shall reduce pressure in both flow and no-flow conditions. The bronze bell housing and access caps shall be threaded to the body and shall not require the use of ferrous screws. The Pressure Reducing Valve shall be a ZURN WILKINS Model 600XLDM.

Model BVECXL

Full Port Bronze Ball Valve with Integral Thermal Expansion Relief Valve

Application

The ZURN WILKINS Model BVECXL is designed for residential water heater applications where a water heater shut-off and thermal expansion relief valve are combined to provide protection from thermal expansion. Ideal where lead-free* valves are required.



Standards Compliance

- IAPMO® Listed
- Certified to NSF/ANSI 372* by IAPMO R&T

*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

Materials

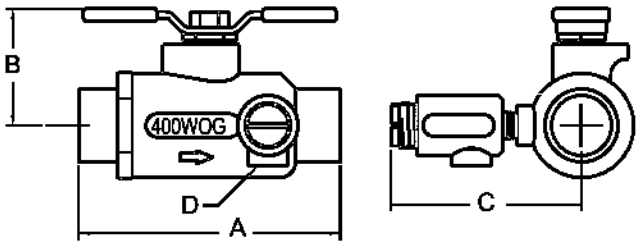
FNPT valve Body	Low Lead Cast Bronze ASTM B 584
Copper sweat Body	Low Lead Forged Brass
PEX Body	
Ball	Chrome plated Low Lead Brass
Stem	Brass ASTM B 16
Seats & Stem packing	TFE virgin Teflon ®
Thrust washer	TFE virgin Teflon ®
Handle & nut	Stainless steel
Relief valve body	Low Lead Forged Brass
Relief valve spring	Stainless steel, 302 Series
Relief valve seat washer	Buna Nitrile (FDA approved)
Relief valve plunger	Brass ASTM B 16 & screw

Features

Sizes: 3/4", 1"	
Pressure rating	400psi WOG
Temperature rating	180°F
Threaded Connections	ANSI B1.20.1 Class 125

Options

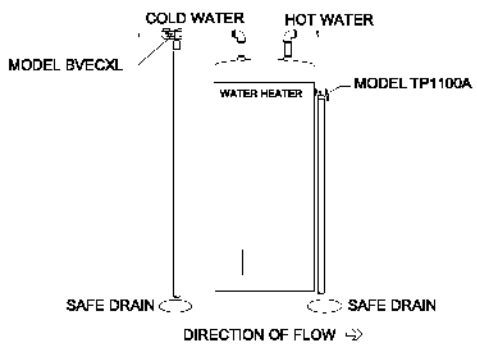
- ☐ 80 - with 80 psi relief setting
- ☐ 100 - with 100 psi relief setting
- ☐ 125 - with 125 psi relief setting
- ☐ BF - 3/8" hose barb drain fitting
- ☐ CF - 3/8" hose compression fitting
- ☐ PEX - 1/2" PEX drain fitting



Dimensions & Weights (do not include packaging)

MODEL	SIZE		CONNECTION	DIMENSIONS (approximate)							WEIGHT	
				A		B		C		D		
	in.	mm		in.	mm	in.	mm	in.	mm		lbs.	kg
34-BVECXLC	3/4	20	SWEAT	3 15/16	100	1 15/16	49	2 13/16	71	1/8" FNPT	1 3/8	0.6
34-BVECXL	3/4	20	FNPT	2 3/4	70	1 5/8	41	2 13/16	71	1/8" FNPT	1	0.5
1-BVECXL	1	25	FNPT	3 1/4	83	1 15/16	49	2 15/16	75	1/8" FNPT	1 1/2	0.7
34-BVECXLPEX	3/4	20	PEX	3 3/16	81	1 1/2	38	2 1/2	64	1/8" FNPT	1	0.5

Typical Installation



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Rev. C
Date: 6/15
Document No. BV-BVECXL
Product No. Model BVECXL

SuperFlex™ – 1245
CCS Tracer Wire

APPLICATION

Copper-clad steel (CCS) tracer wire. Install with underground plastic utility pipes, wires, and cables to ensure future location. Good choice for light-duty open cut/trenching/plowing applications when ground above the utilities can be disturbed and there are no buildings, roadways, or other obstructions in the way.

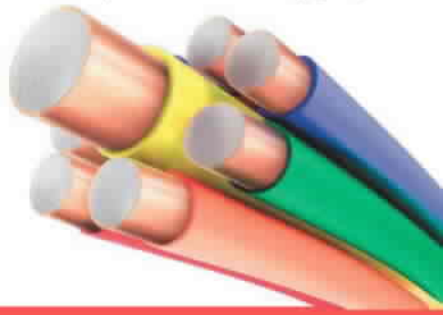
Product Description

#12 AWG (0.0808" diameter) fully annealed, low carbon 1010 grade steel, solid copper-clad steel conductor (CCS) rated at 30 volts, insulated with a 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation rated for direct burial use at 600 volts.

APWA UNIFORM COLOR CODE

- ELECTRIC
- GAS
- COMMUNICATION
- POTABLE WATER
- SEWER
- RECLAIMED WATER

1245*-SF-500 – 500' spool
1245*-SF-1000 – 1000' spool
1245*-SF-2500 – 2500' spool
(* denotes color, pg. 2)



FEATURES AND BENEFITS

- 45 mil HDPE insulation
- 302 lb break load
- Same flexibility as solid copper with superior strength
- Low recoil
- 11% lighter than solid copper means reduced freight expenses
- Copper-clad steel (CCS) wire combines the strength of fully annealed low-carbon steel with the conductivity and corrosion resistance of solid copper
- Bonded metals mean no separating, no corrosion, and no theft appeal
- More stable pricing than solid copper
- Provided exclusively by Copperhead Industries
- Rated for direct bury
- Color-coded to meet American Public Works (APWA) standards for utility identification

SPECIFICATIONS

PART #: 1245*-SF-**
12 (AWG), 45 (insulation mil), * (indicates insulation color: Y=Yellow, B=Blue, G=Green, N=Orange, P=Purple, R=Red, BN=Brown, K=Black, W=White), SF (SuperFlex), ** (indicates spool size: 500, 1000 or 2500 foot lengths)

MADE IN USA
Copperhead® copper-clad steel tracer wire is 100% made in the USA.

PRODUCT DESCRIPTION
Tracer wire shall be a #12 AWG (0.0808" diameter) fully annealed, low carbon 1010 grade steel, solid copper-clad steel (CCS) conductor rated at 30 volts, insulated with 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation rated for direct burial use at 600 volts. CCS conductor must be at 21% conductivity for locating purposes. Break load of 302 lbs. HDPE insulation shall be RoHS compliant and utilize virgin grade material. Insulation color shall meet the APWA color code standard for identification of buried utilities. Manufacturers supplying copper-clad steel tracer wire must have available detailed performance data including 5 years of underground testing in terms of durability related to damage of protective insulation and effects of potential corrosion of the specific copper-clad steel used. Origin of copper-clad steel manufacturer is required and steel core must be manufactured in the United States. If manufacturer has not completed 5-year corrosion testing, a 5-year warranty must be provided. Tracer wire shall be Copperhead® SuperFlex CCS, HDPE 45 mil insulation and made in the USA.

PRINT LINE
Physical, permanent markings: surface legend print on insulation to repeat at minimum interval of every two linear feet. Ink colors will include Black ink for Yellow, Blue, Red, Orange, Purple, Brown, White, and Green insulation, and White ink for Black insulation. **COPPERHEAD * 12 AWG-SOLID SUPERFLEX SF-CCS TRACER WIRE * 45 MIL HDPE 600 VOLT * DIRECT BURIAL ONLY**

SPOOL LABEL
Wound wire on a compact spool made of plastic or wood.

COPPERHEAD INDUSTRIES
1245*-SF-**
12 AWG-Solid CCS Tracer Wire
45 Mil HDPE 600 Volt
Direct Burial Only
copperheadwire.com

CONDUCTOR
This specification describes the properties of the conductor to be used in the fabrication of SuperFlex tracer wire.

Material Description: Copperhead® copper-clad steel wire as manufactured by Copperweld® is composed of a steel core with a uniform and continuous copper cladding thoroughly bonded to the steel throughout. Wire must conform to ASTM B1010 and ASTM B910 / B910M.

- **Cladding**: The steel and copper interface must have a metallurgical bond achieved through a high heat and pressure bonding process. Established process for porosity-free material.
- **Steel:** High strength with 0.10 carbon or greater. Verified to meet required mechanical properties.
- **Copper:** UNS-C10200; OF Copper according to ASTM B-170 (latest revision). High conductivity, oxygen free copper to achieve optimal signal performance.

Surface Condition: Wire surface shall be free of any defects, including flakes, grooves, pits, and voids. Wire surface shall be smooth, bright and shiny, and free of excessive copper dust and residual drawing lubricants.

Physical, Mechanical, and Electrical Properties: The wire shall conform to the properties listed in Table 1.

#12 CCS High Carbon 1055 Grade Steel 21% Conductivity	CCS Conductor
Conductor Size	12 AWG
Conductor Type	Copper-Clad Steel (CCS)
Temper	Dead Soft Annealed (DSA)
Average Break Load	302 lbs.
Minimum Tensile Strength	48,000 psi
Minimum Elongation	10%
Nominal Copper Thickness (% of Diameter)	3%
Nominal Copper Weight	13%
Nominal DC Resistance (ohms/1000 ft.)	7.564

Table 1: Physical, Mechanical, and Electrical Properties **Diameter tolerances: ± 1%*

INSULATION

This specification describes the properties of the material to be used in the insulating of SuperFlex tracer wire.

Material Description: Insulation is comprised of a co-polymer high molecular weight natural high density polyethylene (HDPE) designed specifically for high-speed copper wire insulating. It contains the required levels and types of primary antioxidant and metal deactivator additives to satisfy most Wire and Cable industry requirements. HDPE material will be produced with an excellent balance of surface smoothness, processing ease, tensile and elongation properties, abrasion toughness, environmental stress crack, thermal stress crack resistance, and electrical consistency. Insulation must conform to ASTM D1248.

Physical, Mechanical, and Electrical Properties: The wire shall conform to the properties listed in Table 2.

High Density Polyethylene Insulator	Value
Density (ASTM D 792)	0.943 g/cc
Bulk Density (ASTM D 1895)	0.58 g/cc
Melt Index (ASTM D 1238/E)	0.70 dg/min
Tensile-Yield (ASTM D 638)	4300 psi
Tensile-Ultimate (ASTM D 638)	2900 psi
Tensile-Elongation (ASTM D 638)	850%
Flexural Modulus (ASTM D 790/1)	120,000 psi
Hardness (ASTM D 2240)	63 Shore D
Environmental Stress-Crack (ASTM D 1693/B)	F_{20} > 48 h
Thermal Stress-Crack (ASTM D 2951)	F_0 > 1000 h
Brittleness Temperature (ASTM D 746)	< -95° F
Melting Point (DSC) (ASTM D 3417)	262° F
Softening Point (Vicat) (ASTM D 1525)	250° F
Oxidative Induction Time (ASTM D 3895)	> 50 min. @ 200° C
Dielectric Constant (ASTM D 1531)	2.34 @ 1MHz
Dissipation Factor (ASTM D 1531)	0.00007 @ 1 MHz
Volume Resistivity (ASTM D 257)	5 x 10^{17} ohm-cm
Dielectric Strength (ASTM D 3755)	1000 volts @ 20 mils

Table 2: Physical, Mechanical, and Electrical Properties

QUALITY ASSURANCE

- Copperhead products are manufactured under a quality control system that ensures products are free of defects and meet performance requirements.
- Copperhead provides best-in-class customer service. We promise to put forth our best efforts for our customers and to treat everyone we encounter with courtesy and respect.

COBRA™ ACCESS POINT

APPLICATION

Above-ground access point for tracer wire systems. Available with up to three terminals. 2- and 3-terminal options provide a ground rod wire connection in addition to the tracer wire connection(s). Disconnect/ reconnect jumper to turn ground on and off as needed. Multiple mounting options available.

Also available in white and black

*T1-** – *Cobra 1-terminal*
*T2-** - *Cobra 2-terminal with jumper*
*T3-** - *Cobra 3-terminal with jumper*
(denotes color)*

T1-* T2-* T3-*

FEATURES AND BENEFITS

- Direct connection point for utility locate transmitter
- Polypropylene material is durable and maintenance-free
- Protects wire from damage and corrosion
- Multiple installation options: post mount, hydrant mount, stake mount
- Brass hardware for maximum conductivity
- Thumb nuts eliminate need for wrench
- Can be used with rigid or flexible 1" PVC conduit
- Color-coded to meet American Public Works (APWA) standards

Cobra™ Hydrant Flange Package

T1-*-FLPKG – Cobra 1-terminal with flange
T2-*-FLPKG – Cobra 2-terminal with flange
T3-*-FLPKG – Cobra 3-terminal with flange
HYDFL – flange only
* denotes color

Universal **flange, 1" MTP thread**
(shown with Cobra 2-terminal)

Flange

APWA UNIFORM COLOR CODE

GAS - CANADA
ELECTRIC
GAS
COMMUNICATION
POTABLE WATER
SEWER
RECLAIMED WATER

Cobra™ Mounting Stake

T3-STAKE
- Powder coated steel
- Pointed tip for easy installation
- **12" length**

Mounting Stake