



Department of Community Development

Building Division

4800 West 92nd Avenue Westminster, Colorado 80031
For Information call (303) 658-2075 Fax (303) 706-3922

RESIDENTIAL MULTI-USE FIRE SPRINKLER SYSTEMS
PERMIT SUBMITTAL REQUIREMENTS

History:

- Per the City adopted 2009 IRC, section R313, automatic fire sprinkler systems are required for all one and two family dwellings and townhomes. Per a City amendment, the implementation date of these code provisions was set at January 1, 2013. As of January 1, 2013, the City proceeded with the implementation of residential fire sprinklers.
- Fire sprinklers are not required for additions or alterations to existing buildings.

Multi-purpose vs Stand-alone:

- There are basically two types of residential fire sprinklers systems – multi-purpose and stand-alone.
- Multi-purpose systems are handled through the City Building Division. This includes submittal review, permitting, fees, and inspections.
- Stand-alone systems are handled by the City Fire Division. This includes plan review, permitting, fees, and inspections. In the case of stand-alone systems, separate permits are issued by the City Fire division, as well as separate permit fees are assessed.
- Permits for stand-alone fire sprinkler system are to be submitted after the Building permit has been submitted.
- Building Division permit issuance will not be delayed should a stand-alone system submittal not be received or approved by the Fire Division.
- Installation of the water service line will not be allowed until a fire sprinkler submittal has been received, reviewed, and approved by the City.
- With a stand-alone system, the branch point between the domestic water system and the fire sprinkler system is to occur within the dwelling.
- Any questions regarding stand-alone fire sprinkler systems should be directed to Mike Schafer, Fire Lieutenant-Fire Plans Examiner, at 303-658-4544.

General requirements for submitting a Multi-purpose system.

- The complete fire sprinkler submittal for a multi-purpose system can be included with the building plans when submitting for a new residential build or can be handled as a deferred submittal.
- Provide a “Building Permit Application” form completely filled out.



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- Clearly describe which standard, NFPA 13D or IRC 2904, that the system is being designed and installed under.
- Provide **THREE** copies of all documents other than application (only one copy of the application is required).

Public Works / Water Department Requirements

- Street main system design pressures to be verified with the City Public Works division to insure that any future City infrastructure changes are incorporated into the design. Contact Public works Senior engineer Andy Walsh at 303-658-2563.
- Verify meter information: type, size, and friction loss with City.

Design considerations

- All underground service lines from the main to the meter and from meter to house to be type K copper per City engineering standards.
- See appendix 2 for meter information.
- See appendix 3 for meter pit details



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APPENDIX 1

FIRE SPRINKLER SUBMITTALS ARE TO INCLUDE THE FOLLOW:

System Design information

- Water supply information:
 - Date of test
 - Static pressure
 - Source of information (fire department, water purveyor, contractor)
 - Elevation change between water supply line and main floor elevation of house

- Water Service pipe information
 - Diameter and type of Water Service pipe between water supply and meter
 - Distance between water supply and meter
 - Diameter and type of pipe between meter and riser/ manifold / PRV/ or house shut off valve
 - Distance between water meter and house

- Pressure-reducing devices and friction loss data
 - Examples include backflow preventers, check valves, pressure-reducing valves, water softeners, water filters, and lawn irrigation systems.

- System layout and design; to include
 - Pipe layout
 - Location where Water Service pipe enters house
 - Type of sprinklers, i.e., recessed, concealed, pendant, upright, etc
 - Provide pipe sizing calculations. Provide either computer hydraulic calculations or if prescriptive based, indicated which tables used.

- Provide house construction information on the plans to include:
 - Information as to where vaulted, sloped, or cathedral ceilings occur. Indicate pitch and direction of slope for all pitches greater than 2:12.
 - Information on attic and concealed spaces. Include the type of insulation and its R value. Indicate how piping is being protected from freezing.
 - Information on floor framing, to include how girders / floor beams are being penetrated or routed around.
 - Information on unfinished spaces, to include whether pipe material will be metallic or what protection methods will be used.



WESTMINSTER

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Hydraulic calculations (provide three copies)

Product literature / cut sheets/ calculations (provide three copies)

- Sprinkler heads being used, to include temperature ratings and K-factor
- Pipe materials being used
- Backflow preventers, if used
- Pumps and storage tanks, if used



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APPENDIX 2

Badger E Series Meters Specifications

E-Series Meter	Model E-35	Model E-55
Size	3/4" (DN 20 mm)	1" (DN 25 mm)
Operating Range	0.1 GPM - 32 GPM	0.4 GPM - 55 GPM
Extended Low-Flow Rate	0.05 GPM	0.25 GPM
Maximum Continuous Operation	32 GPM	55 GPM
Pressure Loss	1.8 PSI at 15 GPM	1.8 PSI at 25 GPM

The full pressure loss chart is available at www.badgermeter.com



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Badger Meter

E-Series® Ultrasonic Meter
Cold Water Stainless Steel Meter, 3/4" and 1"
UL Certified for Fire Service Applications
NSF/ANSI Standard 61 Certified, Annex G

DESCRIPTION

The E-Series® Ultrasonic meter uses solid-state technology in a compact, totally encapsulated, weatherproof, and UV-resistant housing, suitable for residential and commercial applications. Electronic metering provides information—such as rate of flow and reverse flow indication—and data not typically available through traditional, mechanical meters and registers. Electronic metering eliminates measurement errors due to sand, suspended particles and pressure fluctuations.

Offered in two sizes, the Ultrasonic meter features:

- UL Listing under UL Subject 327B for residential fire service applications.
- Minimum extended low-flow rate lower than typical positive displacement meters.
- Simplified one-piece electronic meter and register that are integral to the meter body and virtually maintenance free.
- Sealed, non-removable, tamper-protected meter and register.
- Easy-to-read, 9-digit LCD display presents consumption, rate of flow, reverse-flow indication, and alarms.
- Digital or industry standard encoder protocol.

The Ultrasonic meter is available with a wired lead, 308 in-line connector or fully prewired to ORION® and GALAXY® AMR/AMI endpoints. It is also offered with the Itron® in-line connector, in-line connector with pit endpoint, or prewired to an Itron remote endpoint.

APPLICATIONS

This Ultrasonic meter is UL Listed under UL Subject 327B, inferential type water meters used in residential fire service applications. These applications are regulated by local codes and requirements established by the Authority Having Jurisdiction (AHJ). Additional application information is provided in NFPA 13D, one- and two-family residences.

The Ultrasonic meter complies with applicable portions of NSF/ANSI Standard 61, Annex G. There is currently no AWWA standard that specifically addresses ultrasonic meters for residential fire service applications.

OPERATION & PERFORMANCE

As water flows into the measuring tube, ultrasonic signals are sent consecutively in forward and reverse directions of flow. Velocity is then determined by measuring the time difference between the measurement in the forward and reverse directions. Total volume is calculated from the measured flow velocity using water temperature and pipe diameter. The LCD display shows total volume and alarm conditions and can toggle to display rate of flow.



In the normal temperature range of 45...85° F (7...29° C), the Ultrasonic "new meter" consumption measurement is accurate to:

- ±1.5% over the normal flow range
- ±3.0% from the extended low flow range to the minimum flow value

CONSTRUCTION

E-Series Ultrasonic meters feature a stainless steel, lead-free meter housing, an engineered polymer and stainless steel metering insert, a meter-control circuit board with associated wiring, LCD, and battery. Wetted elements are limited to the pressure vessel, the polymer/stainless steel metering insert and the transducers. The electronic components are housed and fully potted within a molded, engineered polymer enclosure, which is permanently attached to the meter housing. The transducers extend through the stainless steel housing and are sealed by O-rings.

The metering insert holds the stainless steel ultrasonic reflectors in the center of the flow area, enabling turbulence-free water flow through the tube and around the ultrasonic signal reflectors. The metering insert's patented design virtually eliminates chemical buildup on the reflectors, ensuring long-term metering accuracy.

METER INSTALLATION

The meter can be installed using horizontal or vertical piping, with flow in the up direction. The meter will not measure flow when an "empty pipe" condition is experienced. An empty pipe is defined as a condition when the flow sensors are not fully submerged.



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Product Data Sheet



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APPENDIX 3

