

Model BVR

5.4 K-factor - Fast Response Residential

Horizontal Sidewall & Recessed Horizontal Sidewall
Glass Bulb Automatic Sprinkler

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General Description

The Central Model BVR, 5.4 K-factor Residential Horizontal Sidewall & Recessed Horizontal Sidewall Sprinklers are decorative glass bulb sprinklers designed for use in residential occupancies such as homes, apartments, dormitories, and hotels.

They are to be used in wet pipe residential sprinkler systems for one- and two-family dwellings and mobile homes per NFPA 13D; wet pipe residential sprinkler systems for residential occupancies up to and including four stories in height per NFPA 13R; or, wet pipe sprinkler systems for the residential portions of any occupancy per NFPA 13.

The recessed version of the Model BVR Residential Horizontal Sidewall Sprinkler is obtained by utilizing the Model BVR Horizontal Sidewall Sprinkler in combination with the Model BV Res./QR Recessed Escutcheon Assembly. The recessed version of the Central Model BVR using a Model BV Res./QR Recessed Escutcheon provides up to 3/8 inch (9.5 mm) of total adjustment from the flush Horizontal Sidewall position.

Operation: The glass bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, which then allows the sprinkler to activate and flow water.

WARNING

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

Because of the above cited stipulations and the varied nature of residential type architecture, there will be some compartment designs which cannot be

fully sprinklered in accordance with the recommendations of NFPA 13, NFPA 13D, or NFPA 13R. In the event of this condition, consult the authorities having jurisdiction for guidance and approval.

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

Design Criteria

The Model BVR Horizontal Sidewall and Recessed Horizontal Sidewall Sprinklers are UL, ULC Listed and MEA Approved for use in accordance with current NFPA standards for use on wet pipe sprinkler systems. These sprinklers have been investigated for use under smooth flat horizontal ceilings with slopes up to 2 inches per foot, at spacings up to 16 feet by 20 feet, using the design requirements found in Table 1. These sprinklers have also been investigated for use under smooth flat sloping ceilings with slopes up to 8 inches per foot, at spacings up to 16 feet by 20 feet, using the design requirements found in Table 2 & 3 as well as the sloped ceiling "Specific Application Design Criteria" found in Figure 1.

The Recessed Horizontal Sidewall Sprinklers are only listed with the Series BV Res./QR Recessed Escutcheon Assembly.

The minimum required single and multiple sprinkler flow rates for systems designed to NFPA 13D or NFPA 13R occupancies are given in Table 1, Table 2, and Table 3. The single sprinkler flow rate is the minimum required discharge from the most hydraulically demanding single sprinkler and, the multiple sprinkler flow rate is the minimum required discharge from each of the total number of "design sprinklers" as specified in NFPA 13D or NFPA 13R.

(Continued on page 2)



Residential Horiz. Sidewall Sprinklers

Technical Data

Sprinkler Identification Number
SIN - C3396

Approvals
UL & ULC Listed. MEA (323-98-E)
(Refer to the Design Criteria Section)

Maximum Working Pressure
175 psi (12.1 bar)

Pipe Thread Connection - 1/2 inch NPT

Discharge Coefficient
K = 5.4 GPM/psi^{1/2} (77.9 LPM/bar^{1/2})

Temperature Ratings - 155°F/68°C

Finishes

Sprinkler: White Polyester, Chrome Plated, or Natural Brass
Recessed Escutcheon: White Coated, Chrome Plated, or Brass Plated

Physical Characteristics

The Model BVR Residential Horizontal Sidewall Sprinkler utilizes a dezincification resistant (DZR) bronze frame and a 3 mm bulb. The sprinkler frame orifice is sealed with a gasketed spring plate (Belleville Seal) consisting of a beryllium nickel disc spring that is sealed on both its inside and outside edges with a Teflon™ gasket. The compression screw is bronze, and the deflector is brass.

SPRINKLERS FOR REPLACEMENT USE ONLY IN EXISTING SPRINKLER SYSTEMS

Design Criteria (Cont.)

TIA 99-1 (Tentative Interim Amendment) with an effective date of May 22, 2000 states that the minimum required discharge from each of the "design sprinklers" for systems designed to NFPA 13 must be calculated based on delivering a minimum design density of 0.1 gpm/sq. ft. for each of the listed coverage areas shown in Table 1, Table 2, or Table 3. Consult the authority having jurisdiction regarding the application of this TIA to the currently adopted NFPA 13.

Model BVR Residential Horizontal Sidewall and Recessed Horizontal Sidewall Sprinklers must be installed using the obstruction and minimum distance between sprinkler criteria for extended coverage sidewall sprinklers found the current edition of NFPA 13.

NOTES

Residential Fire Sprinkler Systems should only be designed and installed by those competent and completely familiar with automatic sprinkler system design, installation procedures, and techniques.

The sprinkler must be secured in position by firmly fastening the sprinkler system piping to the structure. If the sprinkler is not properly secured in position, reaction forces resulting from sprinkler operation could alter its orientation and its water distribution pattern. The sprinkler escutcheon cannot be used to hold the sprinkler in position.

Several criteria may apply to the installation and usage of each sprinkler. Consequently, it is recommended that the sprinkler system designer review and develop a working understanding of the complete list of criteria prior to initiating the design of the sprinkler system.

Questions concerning sprinkler installation and usage criteria, which are not covered by the following instructions, should be submitted to Central Sprinkler. Include sketches and technical details as appropriate.

In some instances, the requirements of this document may concern specifications which are more stringent and which take precedence over those specified in NFPA 13, NFPA 13D, NFPA 13R, or by the authority having jurisdiction.

Installation

The Central Model BVR Horizontal Sidewall Sprinklers must be installed in accordance with the following instructions:

NOTES

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble with an approximate diameter of 1/16 inch should be present.

A leak tight 1/2 inch NPT sprinkler joint should be obtained with a torque of 7 to 14 ft.lbs. (9,5 to 19,0 Nm). A maximum of 21 ft.lbs. (28,5 Nm) of torque is to be used to install 1/2 inch NPT sprinklers. Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Step 1. The sprinkler must only be installed in the sidewall position with the centerline of the sprinkler parallel to the ceiling and perpendicular to the wall. The top of the deflector is to be positioned towards the ceiling.

Step 2. After installing the BV Res./QR Recessed Support Cup (or other acceptable escutcheon, as applicable) over the sprinkler pipe threads and with pipe thread sealant applied to the pipe threads, hand

tighten the sprinkler into the sprinkler fitting.

Step 3. Wrench tighten the sprinkler using only a BV Sprinkler Wrench (1099). The wrench recess of the BV Sprinkler Wrench is to be applied to the sprinkler wrench flats (Ref Figure 3).

Step 4. For Recessed Sidewall Sprinkler Applications, a Protective Cap is available which helps to prevent damage to the sprinkler during ceiling/wall installation and/or during application of the finish coating of the ceiling/wall. Place the Protective Cap over the Recessed Support Cup and push it sideways until it bottoms out against the sprinkler deflector.

NOTE

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

Step 5. After the ceiling/wall has been completed, remove and discard the Protective Cap. If the Sprinkler has been damaged, replace the entire Sprinkler assembly. Do not attempt to modify or repair a damaged sprinkler.

Step 6. Push the outer ring of the Recessed Escutcheon over the Recessed Support Cup. If the Recessed Escutcheon cannot be engaged with the Support Cup or the Recessed Escutcheon cannot be engaged sufficiently to contact the wall, the Sprinkler Fitting must be repositioned.

Table 1 - BVR S/W 1/2" Residential Sidewall Sprinkler Design Requirements Smooth, Flat, Ceiling with a Max. 2:12 Slope

Coverage Area		Minimum Design Flow (Pressure)	
Width	Throw	One Sprinkler	Two or More Sprinklers
12' (or less) (3,7m)	12' (or less) (3,7m)	20 GPM (13.7 psi) 75,8 LPM (0,94 bar)	18 GPM (11.1 psi) 68,2 LPM (0,77 bar)
16' (4,9m)	18' (5,5m)	22 GPM (16.6 psi) 83,4 LPM (1,14 bar)	20 GPM (13.7 psi) 75,8 LPM (0,94 bar)
16' (4,9m)	20' (6,1m)	30 GPM (30.9 psi) 113,7 LPM (2,13 bar)	25 GPM (21.4 psi) 94,8 LPM (1,48 bar)

4" (101.6 mm) to 6" (152.4 mm) below the ceiling.

Table 2 - BVR S/W 1/2" Residential Sidewall Sprinkler Design Requirements Smooth, Flat, Ceiling with a Max. 8:12 Slope with Sprinkler Located at Peak

Coverage Area		Minimum Design Flow (Pressure)	
Width	Throw	One Sprinkler	Two or More Sprinklers
16' (or less) (4,9m)	16' (or less) (4,9m)	22 GPM (16.6 psi) 83,4 LPM (1,14 bar)	20 GPM (13.7 psi) 75,8 LPM (0,94 bar)
16' (4,9m)	18' (5,5m)	22 GPM (16.6 psi) 83,4 LPM (1,14 bar)	20 GPM (13.7 psi) 75,8 LPM (0,94 bar)
16' (4,9m)	20' (6,1m)	30 GPM (30.9 psi) 113,7 LPM (2,13 bar)	25 GPM (21.4 psi) 94,8 LPM (1,48 bar)

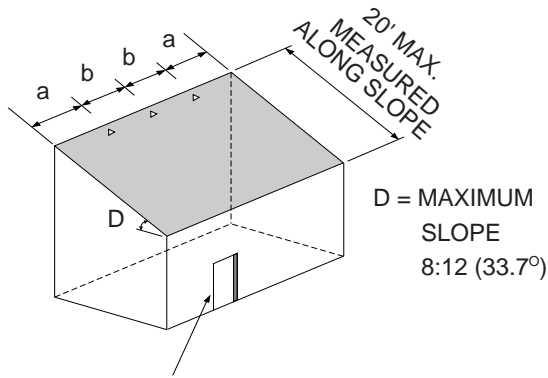
4" (101.6 mm) to 6" (152.4 mm) below the ceiling.

Table 3 - BVR S/W 1/2" Residential Sidewall Sprinkler Design Requirements Smooth, Flat, Ceiling with a Max. 8:12 Slope with Sprinkler Located Along Sloping Wall

Coverage Area		Minimum Design Flow (Pressure)	
Width	Throw	One Sprinkler	Two or More Sprinklers
16' (or less) (4,9m)	18' (or less) (5,5m)	22 GPM (16.6 psi) 83,4 LPM (1,14 bar)	20 GPM (13.7 psi) 75,8 LPM (0,94 bar)

4" (101.6 mm) to 6" (152.4 mm) below the ceiling.

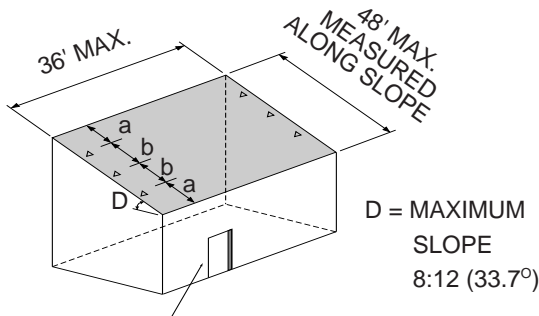
Figure 1 - BVR Sidewall Sloped Ceiling Design Guidelines



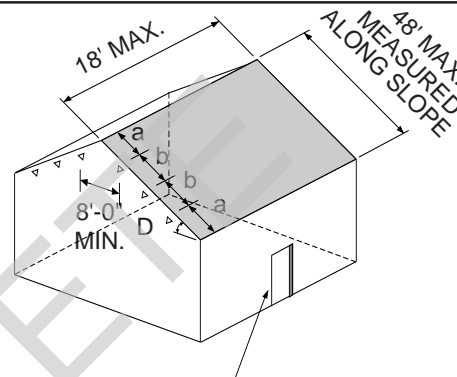
MAXIMUM 8'-0" OPENING
ALLOWED IN PERIMETER WALLS

Sidewall Located at the Peak

- Locate sidewalls at the peak with their deflectors parallel to the slope.
- Number of heads to be calculated shall conform to the appropriate NFPA standard being used for design.
- Maximum number of sidewalls at the peak is unlimited.
- Cathedral ceiling applications: An 8" minimum beam or lintel is required at the peak.
- a: minimum: 4" (101,6 mm)
maximum: one-half the maximum calculated spacing
- b: minimum: 8'-0" (2,4 m)
maximum: 16'-0" (4,9 m)



MAXIMUM 8'-0" OPENING
ALLOWED IN PERIMETER WALLS



MAXIMUM 8'-0" OPENING
ALLOWED IN PERIMETER WALLS

Sidewalls Located Along the Slope

- Up to three sidewalls along each side of the slope can be located with their deflectors parallel to the slope.
- All hydraulic criteria per the appropriate NFPA standard applies.
- **Note: If three sidewalls are present along one wall of one slope, all three must be calculated regardless of the NFPA standard being used for design.**
- Maximum number of sprinklers per compartment is six.
- For cathedral ceiling applications, an 8" minimum beam or lintel is required at the peak.
- a: minimum: 4" (101,6 mm)
maximum: one-half the maximum calculated spacing
- b: minimum: 8'-0" (2,4 m)
maximum: 16'-0" (4,9 m)

Figure 2 - Model BVR Recessed Sidewall (bottom view)

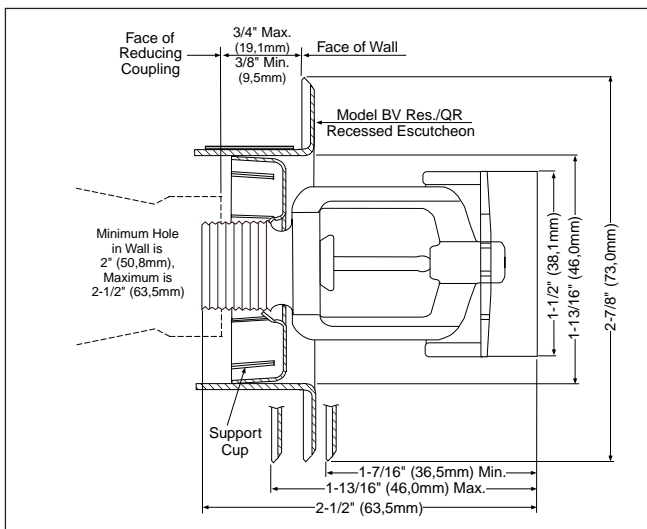
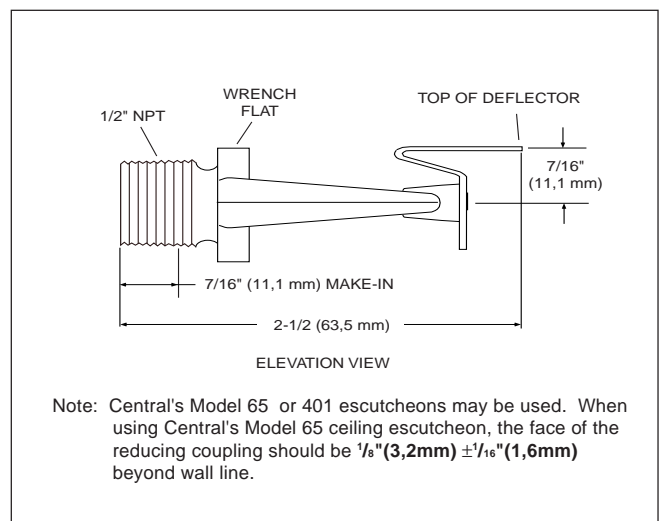


Figure 3 - Model BVR Sidewall



Note: Central's Model 65 or 401 escutcheons may be used. When using Central's Model 65 ceiling escutcheon, the face of the reducing coupling should be $1/8"$ (3,2mm) $\pm 1/16"$ (1,6mm) beyond wall line.



Care & Maintenance

The Central Model BVR Horizontal Sidewall Sprinklers must be maintained and serviced in accordance with the following instructions:

NOTES

Wet pipe sprinkler systems must be maintained at a minimum temperature of 40°F/4°C to prevent freezing and bursting of the pipe and/or sprinklers.

Automatic sprinklers are not to be tested with a heat source. Operation of the heat responsive element (bulb) can result.

Absence of an Escutcheon Plate may delay the time to sprinkler operation in a fire situation.

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

Do NOT enclose sprinklers within drapes, curtains, or valances.

Do NOT hang anything from the sprinklers.

Do NOT cleanse the sprinklers with soap and water, detergents, ammonia, cleaning fluids, or other chemicals. Remove dust, lint, cobwebs, cocoons, insects, and larvae by gently brushing with a feather duster or gently vacuuming with a soft bristle (i.e., dusting) brush attachment.

Exercise suitable safety precautions in the use and storage of highly flammable materials. The rapid rate of fire development and spread of which can be caused by such materials can reduce the ability of the sprinkler system to aid in the control of a fire in which they are involved.

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

Automatic sprinklers must never be shipped or stored where its temperature will exceed 100°F/38°C and they must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be

replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

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

The Central Model BVR Horizontal Sidewall Sprinklers must only be replaced with sidewall sprinklers which are listed for residential fire protection service and which have the same nominal K-factor, the same coverage area, and the same or lower flow ratings (as indicated under "Design Criteria").

When remodeling, such as by adding false beams or light fixtures or changing the location of compartment walls, first verify that the new construction will not violate the installation requirements stated under WARNINGS. Alter the new construction and/or the sprinkler system to suit the requirements of this document.

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

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



Limited Warranty

Products manufactured by Tyco Fire Products are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by

ownership with Tyco Fire Products or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

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THE FOREGOING WARRANTY IS MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.



Ordering Information

Ordering Information: When placing an order, indicate the full product name. Please specify the quantity, model, style, orifice size, temperature rating, type of finish or coating, and sprinkler wrench. Refer to price list for complete listing of Part Numbers.

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