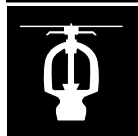


Model BV & BV-QR Intermediate Level 5.6 K-factor Standard & Quick Response

Upright & Pendent Pendent Glass Bulb Automatic Sprinkler

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General Description

The Central Model BV, 5.6 K-factor Upright & Pendent Standard Response and Model BV-QR, 5.6 K-factor Upright & Pendent Quick Response, Intermediate Level Automatic Sprinklers are designed for use in sprinkler systems having sprinklers at multiple elevations in the same area. Intermediate Level Sprinklers are primarily designed for use in rack storage sprinkler systems, where their thermally sensitive elements must be shielded from the water spray of higher elevation sprinklers which could operate earlier during a fire. Intermediate Level Sprinklers are also used in applications such as beneath open gridded catwalks.

The upright versions come complete with the water shield affixed to the sprinkler. The pendent versions can be created using a Model BV or BV-QR Standard Spray Sprinkler and a separate water shield (WS-3) that is threaded on the 1/2 inch NPT of the sprinkler prior to installing the sprinkler into the fitting.

If there is a possibility that the Intermediate Level Sprinklers may be exposed to mechanical damage, a head guard and/or water shield assembly (G-3 or WSG-3) can be added to the Model BV or BV-QR Standard Spray Sprinkler, creating an Intermediate Level Sprinkler.

These sprinklers are available with a polyester coatings that may be utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres.

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

chemical to which the sprinklers will be exposed.

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 & flow water.

WARNING

The Model BV & BV-QR Intermediate Level 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.

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.



Technical Data

Sprinkler Identification Number

SIN C3198 - BV Int. Level Upright
SIN C3200 - BV Pendent*
SIN C3100 - BV Upright*
SIN C3199 - BV-QR Int. Level Upright
SIN C3201 - BV-QR Pendent*
SIN C3101 - BV-QR Upright*

*add Head Guard and/or Shield

Approvals

UL & ULC Listed. FM & NYC Approved
(The approvals apply only to the service conditions indicated in the Design Criteria Section)

Maximum Working Pressure

175 psi (12,1 bar)
250 psi (17,3 bar) - UL & ULC

Pipe Thread Connection

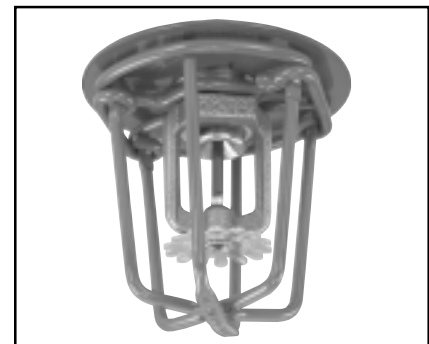
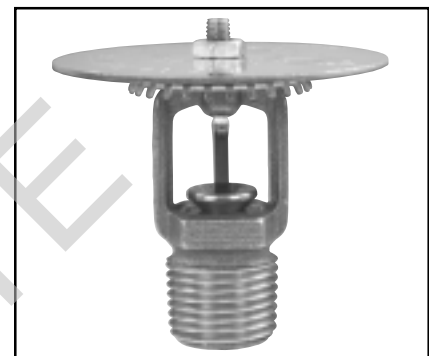
1/2 inch NPT

Discharge Coefficient

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

Temperature Ratings

135°F/57°C, 155°F/68°C, 175°F/79°C
200°F/93°C, 250°F/121°C, 286°F/141°C



Intermediate Level Automatic Sprinklers

Finishes

Sprinkler: White Polyester, Chrome Plated, or Natural Brass

Head Guard/Shield: Red or Chrome

Corrosion Resistant Coatings

Sprinkler: White Polyester (UL only)

Physical Characteristics

The Model BV & BV-QR Upright & Pendent Sprinklers utilize a dezincification resistant (DZR) bronze frame and a 3 mm (quick response) or 5 mm (standard response) bulb. The two-piece button assembly is brass and copper. 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, & the deflector is brass.

Figure 1- Factory Assembled, Multi-Level Upright

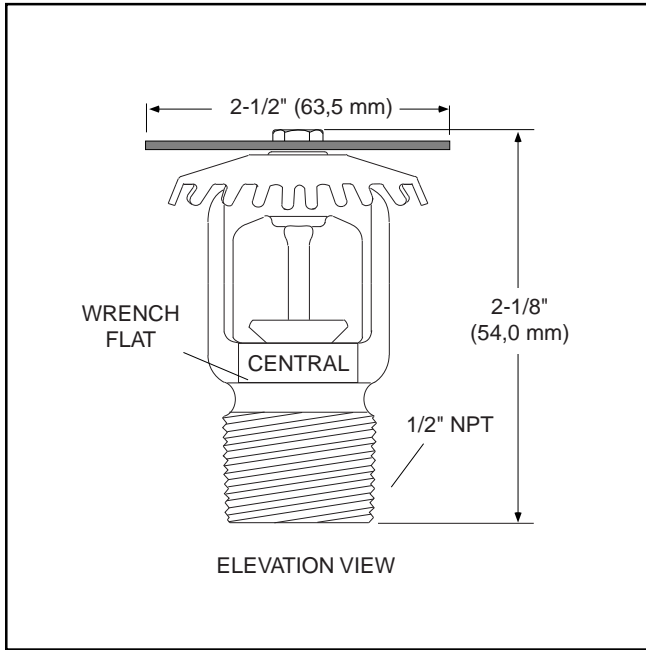
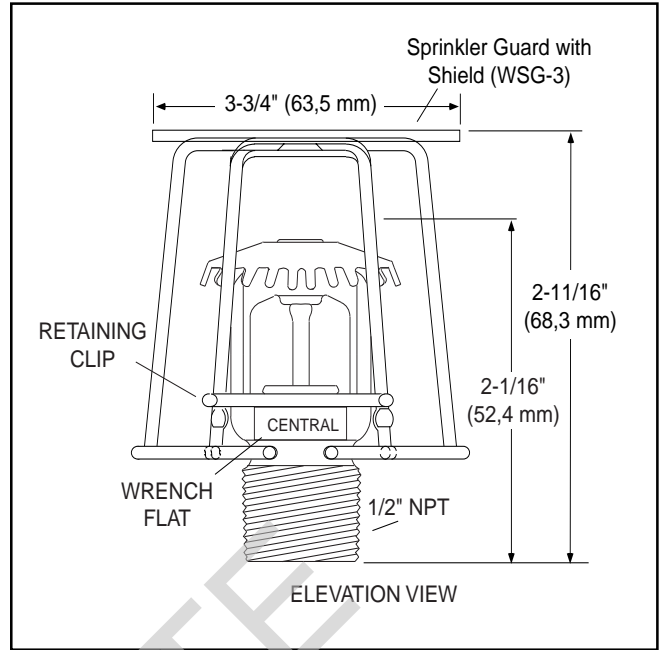


Figure 2 - Multi-Level Upright with Guard and Shield



Design Criteria

The 135°F/57°C, 155°F/68°C, 175°F/79°C, 200°F/93°C and 286°F/141°C, Model BV, Standard Response, Upright & Pendent Intermediate Level Sprinklers (Ref. Table 1), whether factory assembled or created using the Model BV Standard Spray Sprinkler (see Data Sheet 1-5.0) and a Head Guard and/or Water Shield, are UL, ULC Listed and NYC Approved (MEA 466-92-E Vol. III) for use in accordance with current NFPA standards and FM Approved for use in accordance with the FM Loss Prevention Data Sheets. The Upright Sprinklers are listed/approved with both the G-3 and WSG-3 Head Guard. The Pendent Sprinklers are approved with the G-3 Head Guard and WS-3 Water Shield. Factory assembled Intermediate Level Sprinklers cannot be used with a Head Guard Assembly.

The 135°F/57°C, 155°F/68°C, 175°F/79°C, 200°F/93°C and 250°F/121°C, Model BV-QR, Quick Response, Upright & Pendent Intermediate Level Sprinklers (Ref. Table 1), whether factory assembled or created using the Model BV-QR Standard Spray Sprinkler (see Data Sheet 1-7.0) and a Head Guard and/or Water Shield, are UL, ULC Listed and NYC Approved (MEA 466-92-E Vol. III) for use in accordance with current NFPA standards and FM Approved for use in accordance with

the FM Loss Prevention Data Sheets. The Upright Sprinklers are listed/approved with both the G-3 and WSG-3 Head Guard. The Pendent Sprinklers are approved with the G-3 Head Guard and WS-3 Water Shield. Factory assembled Intermediate Level Sprinklers cannot be used with a Head Guard Assembly.

NOTE

Inquiries concerning the appropriateness of wax or lead coated sprinklers for a given corrosive environment should be submitted to the attention of the Technical Services Department. Wax or lead coated sprinklers are not suitable for use in open sprinkler applications.

**Table 1 - Laboratory Listings and Approvals
Factory Assembled BV/BV-QR Multi-Level Sprinklers**

		SPRINKLER FINISH & STYLE		
Temperature Rating	Bulb Color Code	Natural Brass	Chrome Plated	Polyester Coated
135°F/57°C	Orange	1,2,3,4	1,2,3,4	1,2,3,4
155°F/68°C	Red	1,2,3,4	1,2,3,4	1,2,3,4
175°F/79°C	Yellow	1,2,3,4	1,2,3,4	1,2,3,4
200°F/93°C	Green	1,2,3,4	1,2,3,4	1,2,3,4
250°F/121°C	Blue	1,2,3,4	1,2,3,4	1,2,3,4
286°F/141°C	Blue	1,2,3,4	1,2,3,4	1,2,3,4

1. Listed by Underwriters Laboratories, Inc.
2. Listed by Underwriters' Laboratories of Canada (ULC).
3. Approved by Factory Mutual Research Corporation.
4. Approved by the City of New York under MEA 466-92-E

Figure 3 - Factory Assembled, Multi-Level Pendant

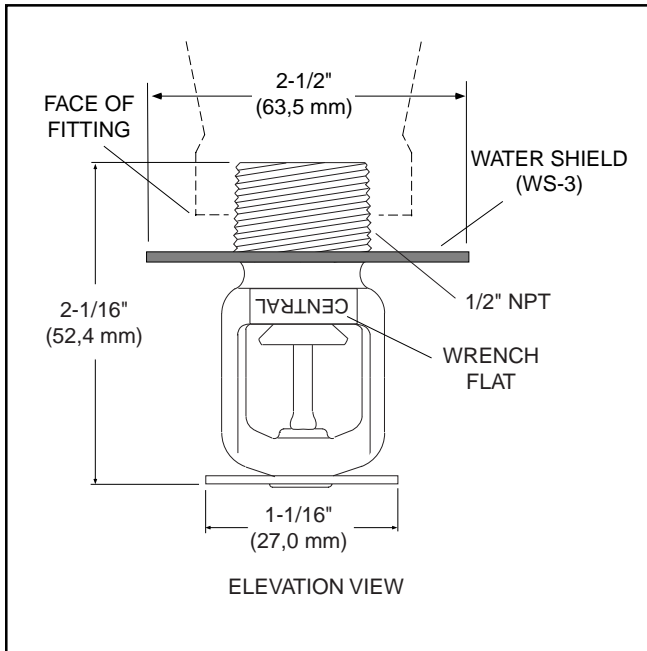
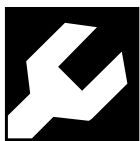
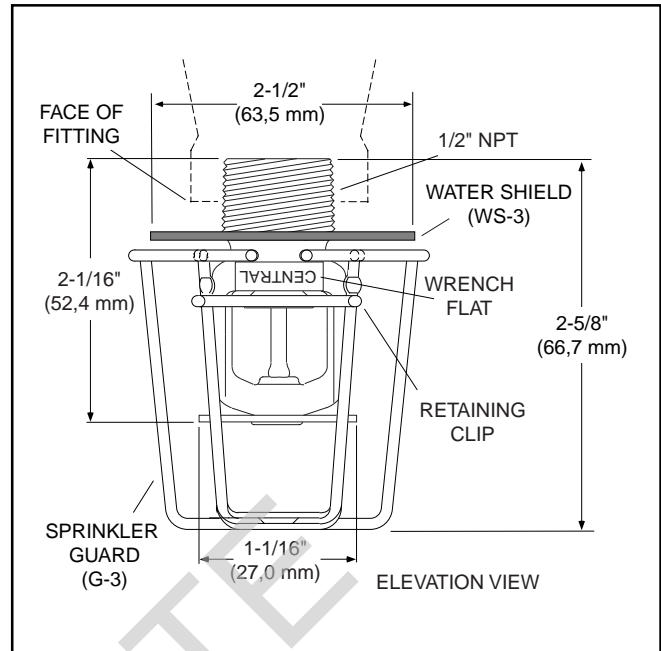


Figure 4 - Multi-Level Pendant with Water Shield & Guard



Installation

The Model BV/BV-QR Intermediate Level Automatic Sprinklers must be installed in accordance with the following instructions.

NOTES

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

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.

Upright Sprinklers

Step 1. Upright sprinklers must be installed only in the upright position. The deflector is to be parallel to the ceiling, roof, or mounting surface, as applicable.

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

Step 3. Tighten the sprinkler into the sprinkler fitting using only the Combination Wrench (Ref. Fig. 5). The Combination Wrench is to be applied to the wrench flats only.

Pendant Sprinklers

Step 1. Pendant sprinklers must be installed only in the pendant position. The deflector is to be parallel to the ceiling, roof, or mounting surface, as applicable.

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

Step 3. Tighten the sprinkler into the sprinkler fitting using only the Combination Wrench (Ref. Fig. 5). The Combination Wrench is to be applied to the wrench flats only.

Pendant Sprinkler Created using the WS-3 Water Shield

Step 1. Pendant sprinklers must be installed only in the pendant position. The deflector is to be parallel to the ceiling, roof, or mounting surface, as applicable.

Step 2. Thread the WS-3 Water Shield onto the sprinkler threads with the stamped marking toward the deflector and just to the end of the threads. There should be an 1/8 inch (3,2 mm) gap between the plate and the Sprinkler Wrench Flat.

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

Step 4. Tighten the sprinkler into the sprinkler fitting using only the Combination Wrench (Ref. Fig. 5). The Combination Wrench is to be applied to the wrench flats only.

Step 5. Rotate the WS-3 Water Shield clockwise (looking up) so that it engages with the sprinkler threads.

Figure 5 - Combination Sprinkler Wrench
(Part #1106)





Installation (Cont.)

Head Guards

Step 1. After the sprinkler has been installed, gently spread the two base sections of the G-3 or WSG-3 Head Guard and slide the guard around the sprinkler head so the base of the guard is located between the sprinkler threads and the wrench flats of the sprinkler.

Step 2. Fasten the two horizontal retaining clips (Ref. Fig 2 & 4) in place, over the proper vertical rib of the guard. Make sure this action results in a tight fit between the clip and the rib. If not, bend the clip slightly and repeat the procedure until a tight fit is obtained.

Step 3. If installing the G-3 Head Guard on a pendent sprinkler with the WS-3 Water Shield, turn the water shield clockwise on the sprinkler thread until it "bottoms out" against the base of the wire guard.



Care & Maintenance

The Model BV/BV-QR Intermediate Level Sprinklers must be maintained and serviced in accordance with the following instructions.

NOTES

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

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 their temperatures 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 replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

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

Frequent visual inspections are recommended to be initially performed for polyester coated sprinklers installed in corrosive environments, after the installation has been completed, to verify the integrity of the polyester coating. Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting from the floor level, a random sampling of close-up visual inspections should be made, so as to better determine the exact sprinkler condition and the long term integrity of the polyester coating, as it may be affected by the corrosive conditions present.

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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