



## Model F1FR EPEC 115 Enhanced Protection Extended Coverage Pendent & Recessed Pendent Sprinkler

### Model F1FR EPEC 115 (RA 1212)

#### Features

1. Maximum coverage area up to 17.64m<sup>2</sup> compared to traditional 12m<sup>2</sup>.
2. Maximum sprinkler spacing up to 4.2m compared to traditional 3.5m.
3. Reduced installation cost by using less sprinklers and system branch pipes.
4. Reduced water storage volume to 30 minutes instead of 60 minutes.
5. Storage height up to 4.5 m for OHIII.
6. LPCB approved for OHIII group protection under Technical Bulletin 222.
7. Available in brass, chrome and white.

#### Listings & Approvals

1. LPCB Approved, LPCB Ref. No. 0341/01.

#### Product Description

The Reliable Model F1FR EPEC 115 Enhanced Protection Extended Coverage Pendent Sprinklers is intended for Ordinary Hazard Group 3 protection using Technical Bulletin 222 described in LPC Rules for Automatic Sprinkler Installations or BS EN 12845.

Use of Model F1FR EPEC 115 Sprinklers, complying with an exacting performance specification, allows increased sprinkler coverage areas of up to 17.64 m<sup>2</sup> per sprinkler. The protection described has been based on extensive sprinkler tests involving Actual Delivered Density (ADD) and commodity fire tests.

Model F1FR EPEC 115 Sprinklers developed for use at 17.64 m<sup>2</sup> have a significantly different water distribution characteristic from conventional and spray pattern sprinklers. In addition to meeting the constructional requirements of EN 12259: Part 1: Sprinklers.

#### Operation

The Reliable Model F1FR EPEC 115 Enhanced Protection Extended Coverage Pendent Sprinklers utilize a 3mm diameter glass bulb. The glass bulb consists of an accurately controlled amount of special fluid hermetically sealed inside a precisely manufactured glass capsule. This glass bulb is specially constructed to provide fast thermal response. The balance of parts are made of brass, copper and beryllium nickel.



F1FR EPEC 115  
Pendent



F1FR EPEC 115  
Recessed Pendent

All normal temperatures, the glass bulb contains the fluid in both the liquid and vapor phases. The vapor phase can be seen as a small bubble. As heat is applied, the liquid expands, forcing the bubble smaller and smaller as the liquid pressure increases. Continued heating forces the liquid to push out against the bulb, causing the glass to shatter, opening the waterway and allowing the deflector to distribute the discharging water.

The temperature rating of the sprinkler is identified by the color of the glass bulb.

#### Design Criteria

Occupancy and Fire Hazard

OH3/10

OH3/12,5

The following conditions shall be met:

- The maximum storage heights specified in Table 1 shall not be exceeded.
- The maximum storage area shall not exceed 100m<sup>2</sup> for any single block with less than 1,5m clearance around the block.
- The maximum ceiling height shall not exceed 5,5 m.
- Ceiling slope shall not exceed 9 ½° (170 mm/m).
- Containers with an open top shall not be stored in the protected areas. **Note:** Containers with the open end down are acceptable.
- No process occupancies classified as OH4 shall be within the protected areas.

## Technical Data

| Sprinkler Identification No. | Sprinkler Type | Thermal Sensitivity | Thread Size                | Nominal K-factor |        | Temperature Rating                           | Max. Ambient Temperature                     | Max. Working Pressure | Sprinkler Height |
|------------------------------|----------------|---------------------|----------------------------|------------------|--------|--|--|-----------------------|------------------|
|                              |                |                     |                            | US               | Metric |  |  |                       |                  |
| RA 1212                      | Pendent        | Quick Response      | 3/4 - 14 BSPT per ISO R7-1 | 8.0              | 115    | 135°F (57°C)<br>155°F (68°C)<br>175°F (79°C) | 100°F (38°C)<br>100°F (38°C)<br>150°F (66°C) | 175 psi (12,1 bar)    | 2.33 in. (59mm)  |

**Table 1. Maximum Storage Heights for OH Group 3 EPEC Protection**

| Type of Installation | Maximum Storage Height<br>m                                |                   |   |   |
|----------------------|--|-------------------|---|---|
|                      | OH 3/10 Wet-pipe and Pre-action Type B, OH 3/12,5 Dry-pipe |                   | OH 3/12,5 Wet-pipe and Pre-action Type B      |   |
| Storage Category     | Free Standing or Block Stacking <sup>(2)</sup>             | All Other Storage | Free Standing or Block Methods <sup>(3)</sup> | All Other Storage Methods <sup>(2)(4)</sup> |
| I                    | 4,0  | 3,5               | 4,5   | 4,0   |
| II                   | 3,0  | 2,6               | 4,0   | 3,5   |
| III                  | 2,1  | 1,7               | 3,1   | 2,6   |
| IV <sup>(5)</sup>    | 1,2  | 1,2               | 1,5   | 1,5   |

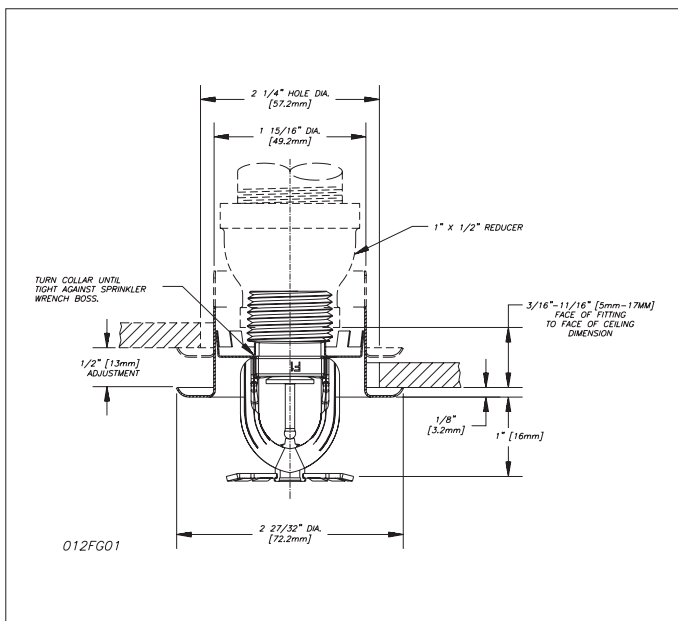
### Notes:

- (1) Wet pipe systems are preferred.
- (2) Free standing and block stacking STI only.
- (3) All other storage methods ST2 to ST6.
- (4) Storage to the heights specified may not exceed 4m<sup>2</sup> in plan area. See TB222.3.2.
- (5) Not including exposed expanded plastic.

### Limitations of use

This form of protection should not be used where any of the following conditions occur:

1. Materials in which fire can not readily be controlled by sprinklers (example: acrylic fiber yarn storage).
2. Commodities or storage arrangements which may give rise to unusually severe fire characteristics (example: lightweight paper storage).
3. Open top storage containers (example: open top tote boxes).
4. Ceilings with joists, deep beams or significant obstructions.
5. Dry-pipe installations where the calculated time for water to discharge from any sprinkler in the installation or the measure time from a test valve exceeds the maximum time specified in TB222.11.2.
6. Town main connections or reduced capacity water storage tanks where the performance of the town main has not been verified by testing.



**Fig. 1- F1FR EPEC 115 Recessed Pendent**

**Table 2 - Hydraulic Design Criteria**

| Hazard Classification | Low Flow Conditions                   |                                | High Flow Conditions          |  |                                       |
|-----------------------|---------------------------------------|--------------------------------|-------------------------------|--|---------------------------------------|
|                       | Min. Operating Sprinkler Pressure Bar | Number of Sprinklers Operating | Minimum Design Density mm/min | Area of Operation  |                                       |
|                       |                                       |                                |                               | Wet Pipe and Pre-action Type B Installation m <sup>2</sup> | Dry Pipe Installations m <sup>2</sup> |
| OH 3/10               | 1,9 <sup>(1)</sup>                    | 4                              | 6,0                           | 160  | ~ <sup>(3)</sup>                      |
| OH 3/10               | 2,3 <sup>(1)</sup>                    | 4                              | 6,0                           | 160  | ~ <sup>(3)</sup>                      |
| OH 3/12,5             | 3,0 <sup>(2)</sup>                    | 4                              | 6,5                           | 160  | 200                                   |
| OH 3/12,5             | 3,6 <sup>(2)</sup>                    | 4                              | 6,5                           | 160  | 200                                   |

**Notes:**

- (1) A 1,93 bar sprinkler operating pressure generates a density of 10 mm/min with a sprinkler k-factor of 115 and coverage area of 16 m<sup>2</sup>/sprinkler.
- (2) A 3,02 bar sprinkler operating pressure generates a density of 12,5 mm/min with a sprinkler k-factor of 115 and coverage area of 16m<sup>2</sup>/sprinkler.
- (3) OH3/10 level of protection not suitable for dry pipe installations, use OH3/12,5.

**Water Supply Duration**

The water supplies for the sprinkler installation shall be capable of providing sufficient pressures and flows to satisfy the installation demand condition determined by the calculations, specified in Table 3.  
 Water supplies shall be capable of automatically furnishing at least the required pressure-flow conditions of the installations for a period of not less than 30 minutes.

**Table 3 - Calculation of Maximum Flow Demand, Minimum Allowable Densities and Pressures**

| Calculation Set                         | Condition Specified in Table TB222.T3 | Area of Operation/Sprinklers operating (m <sup>2</sup> /number) | Location of Area of Operation or Sprinklers Operating | Calculation Results   |
|---|---------------------------------------|---|---|---|
| 1. Maximum Demand Flow                  | High Flow Condition                   | 160 <sup>(1)</sup><br>200 <sup>(3)</sup>                        | Hydraulically Most Favorable                          | Flow from sprinklers within area of operation, any additional sprinklers <sup>(5)</sup> |
| 2. Minimum Allowable Density            | High Flow Condition                   | 160 <sup>(1)</sup><br>200 <sup>(2)</sup>                        | Hydraulically Most Remote <sup>(4)</sup>              | Density from hydraulically most remote four sprinklers within area operations           |
| 3. Minimum Sprinkler Operating Pressure | Low Flow Condition                    | 4 Sprinklers  | Hydraulically Most Remote                             | Sprinkler operating pressure for four sprinklers operating                              |

**Notes:**

- (1) Area of operation for wet-pipe and pre-action Type B installations.
- (2) Area of operation for dry-pipe installations.
- (3) The calculation set must verify the location of the hydraulically most favorable area of operation in the installation; see BSEN Clause 13.4.2.2.
- (4) The calculation set must verify the location of the hydraulically most remote area of operation in the installation; see BSEN Clause 13.4.2.1.
- (5) Flow from any additional sprinklers that are located within the area of operation, such as sprinklers beneath obstructions, shall be included in the calculation.

**Spacing and Location of Sprinklers**

- The clearance between deflector and top of storage is 1m.
- The maximum area of coverage per sprinkler is 17,64 m<sup>2</sup>/sprinkler.
- The maximum spacing of sprinklers across or along ranges shall not exceed 4,2m (standard layout).
- The maximum spacing of sprinklers across ranges shall not exceed 4,2 m (staggered layout).
- The maximum spacing of sprinklers along ranges shall not exceed 4,6m (staggered layout).
- The minimum spacing between sprinklers shall not be less than 2,0m unless provisions are made to prevent cooling or wetting of adjacent sprinklers.
- The maximum distance from walls and partitions shall be 2,1m for standard spacing; 2,3m for staggered spacing; or, 1,5m where the external walls are combustible or are metal, with or without combustible linings or insulating materials.
- Sprinkler deflector to ceiling/roof distance shall be 30mm to 150mm.

**Table 4 - Obstructions**

| Maximum Horizontal Distance from Sprinkler Vertical Axis to Side of Obstruction, mm | Maximum Height of Sprinkler Deflector Above(+) or Below(-) the Bottom of the Obstruction, mm |
|---|--|
| 200   | -10  |
| 400   | 0  |
| 600   | 60   |
| 800   | 120  |
| 1000  | 200  |
| 1200  | 280  |
| 1400  | 360  |
| 1600  | 470  |
| 1800  | 670  |

**Note: Dimensions may be interpolated**

**Installation**

The Model F1FR EPEC115 Sprinklers are to be installed and maintained in accordance with LPC rules for Automatic Sprinkler Installations incorporating BS EN 12845, except where otherwise specified in this Technical Bulletin.

All pipe sizing shall be by hydraulic calculation. Pre-calculated pipe sizing tables shall not be used.

Where dry-pipe sprinkler installations are to be used, the time for water to discharge from any sprinkler in the installation shall be predicted by calculation at the design stage. The calculated time to discharge shall comply with TB222.11.2.

**Note:** In order to ensure compliance of dry-pipe systems with the time for water to discharge from an open sprinkler it may be prudent to assume a shorter discharge time than 30 seconds at the design stage to ensure compliance when tested.

When installing Model F1FR EPEC115 Pendent Sprinklers, use the Model HW Sprinkler Wrench. Any other type of wrench may damage these sprinklers.

**Note:** A leak tight 3/4" NPT (R3/4) sprinkler joint can be obtained with a torque of 14-20 ft-lbs (19-27,1 N-m). Do not tighten sprinklers over maximum recommended torque. It may cause leakage or impairment of the sprinklers.

**Maintenance**

The Model F1FR EPEC115 Sprinklers should be maintained and inspected by certified sprinkler installers and supervising bodies may be found listed in specifier's guides, such as the LPCB's List of Approved Fire and Security Products and Services: Part 5, Section 1A and 1B (see TB201).

Do not clean sprinklers with soap and water, ammonia or any other cleaning fluid. Remove any sprinkler that has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or non-operated sprinklers. Prior to installation, sprinkler should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

**Ordering Information**

- Specify
1. Sprinkler Model
  2. Temperature Rating
  3. Sprinkler Finish

**Finishes:**

- Bronze
- Chrome
- White

**Installation Wrench**

Model HW Sprinkler Wrench



The equipment presented in this bulletin is to be installed in accordance with the latest pertinent Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances, whenever applicable.

Products manufactured and distributed by RELIABLE have been protecting life and property for over 80 years, and are installed and serviced by the most highly qualified and reputable sprinkler contractors located throughout the United States, Canada and foreign countries.

Manufactured by



**The Reliable Automatic Sprinkler Co., Inc.**

(800) 431-1588 Sales Offices  
 (800) 848-6051 Sales Fax  
 (914) 829-2042 Corporate Offices  
 www.reliable sprinkler.com Internet Address



Revision lines indicate updated or new data.  
 EG. Printed in U.S.A. 2/07 P/N 9999970320