

# Reliable®

## Model N252 EC Pendent for Control Mode Specific Application (CMSA)

### Model N252 (SIN RA0842) Nominal K-Factor = 25.2

#### An Extended Coverage Sprinkler for Storage Applications

##### Features

- Approved by FM Global for the following storage applications:  
Class 1-4, cartoned unexpanded plastic commodities under ceilings up to and including 35 feet (10.7 m) high. They may be used to protect solid piled, palletized, shelf or bin box and open frame rack storage.\*
- For other storage commodities and storage arrangements, see FM Global Data Sheets 8-9.
- Approved for installation per NFPA 13 Alternative Sprinkler System Designs (Chapter 21 in 2013 and 2016 editions and Chapter 24 in 2019 edition).
- Eliminates the need for in-rack sprinklers.\*
- Extended coverage, low pressure, and low flow demand provides the opportunity to reduce:
  - Labor
  - Piping and fittings
  - Fire pump size
  - Tank size
- 165 °F (74 °C) and 212 °F (100 °C) temperature ratings.
- Maximum deflector distance from ceiling is 13½" (343mm), 12" (305mm) to center line of thermal element.
- This is a Quick Response CMSA sprinkler that meets the requirements of IFC 2015 for the elimination of smoke/heat vents in storage occupancies.
- US Pat. No. 7,624,812  
Other Patents Pending.



N252 EC Pendent

##### Listings and Approvals

FM Approved as a storage sprinkler.

##### Product Description

The Model N252 EC Pendent are Control Mode Specific Application Extended Coverage Sprinklers for Storage Applications. This includes protection of the storage and display of Class I through IV commodities encapsulated or unencapsulated, cartoned unexpanded plastics. The Model N252 EC sprinklers offer maximum coverage areas up to 14 ft by 14 ft (196 ft<sup>2</sup>) as compared to ESFR or Standard Coverage Control Mode or Control Mode Specific Application sprinklers with maximum coverage of 100 ft<sup>2</sup> (9m<sup>2</sup>). This offers the advantage of decreasing the number of required sprinklers, reducing labor and material costs. The Model N252 EC Pendent Control Mode Specific Application Sprinklers is designed for use in ceiling only sprinkler systems with no in-rack sprinklers required.

\* See Design Criteria for details, Tables 1 & 2.

**Table 1: Design Criteria for FM Class 4 and Cartoned Unexpanded Plastics in Open Frame Racks**

| Maximum Building Height Feet (m) | Maximum Storage Height* Feet (m) | Minimum Pressure Psi (bar) | Maximum Spacing Feet (m) | Number of Design Sprinklers | Hose Stream Allowance GPM (L/min) | Water Supply Duration |
|----------------------------------|----------------------------------|----------------------------|--------------------------|-----------------------------|-----------------------------------|-----------------------|
| 25 (7,5)                         | 20 (6,0)                         | 25 (1.7)                   | 14 x 14 (4,3 x 4,3)      | 6                           | 250 (950)                         | 1 Hour                |
| 30 (9,1)                         | 25 (7,6)                         | 30 (2.1)                   | 14 x 14 (4,3 x 4,3)      | 6                           | 250 (950)                         | 1 Hour                |
| 35 (10,7)                        | 30 (9,1)                         | 40 (2.8)                   | 12 x 12 (3,6 x 3,6)      | 8                           | 250 (950)                         | 1 Hour                |

\* Storage must be a minimum of 3' (0.9m) below the deflector

## Operation

The Reliable Model N252 Extended Coverage Pendent Control Mode Specific Application Storage Sprinklers utilize a levered fusible alloy solder link. When the rated temperature is reached, the solder melts and the two link halves separate allowing sprinkler to operate and water to flow.

FM Approved for the following:

**1. Application:** These FM Approved extended coverage CMSA automatic sprinklers may be used to protect Class 1 through 4, cartoned unexpanded plastic commodities under ceilings up to and including 35 ft (10.7 m) high. They may be used to protect any storage arrangement outlined in Data Sheet 8-9, however portable racks must meet the guidelines required to be considered open-frame racks. Maintain a minimum clearance of 3 ft (0.9 m) between the top of storage and the sprinkler deflector.

**Temperature Rating** - The Reliable Model N252 EC sprinkler is available in nominal temperature ratings of either 165 °F (70 °C) or 212°F (100°C). Use the nominally rated 165°F (70°C) sprinkler for all acceptable applications unless the ambient temperature of the protected occupancy requires the temperature rating to be 212°F (100°C).

**2. Hydraulic Design:** Base the design for these automatic sprinklers as follows:

**Solid-Piled, Palletized, Shelf or Bin-Box and Open-Frame Racks:** See table 1

**Storage Racks Equipped With Solid Shelves:** Base the design of the ceiling sprinkler system as outlined above for open-frame racks, however base the need for, as well as the design of, in-rack sprinkler protection the same as what is required for K16.8 (K240) CMSA sprinklers.

**Shape of Operating Area:** Base the shape of the operating area on a 1.2 shape factor for ceiling slopes up to 5° or a 1.4 shape factor for ceilings having a higher slope (up to 10° maximum).

**3. System Type:** Wet-pipe sprinkler systems or pre-action sprinkler systems, whose sprinkler protection design can be based on the equivalent of a wet-pipe system, are acceptable.

**4. Sprinkler Spacing:** The minimum and maximum linear distances between sprinklers. are 10 ft (3.1 m) and 14 ft (4.2 m), respectively for ceiling heights up to and including 30 ft (9.0 m); for ceiling heights over 30 ft (9.0 m) and up to 35 ft (10.7 m) the maximum linear spacing of the sprinkler is reduced to 12 ft (3.6 m), The minimum and maximum area of coverage per sprinkler is 100 ft<sup>2</sup> (9 m<sup>2</sup>) and 196 ft<sup>2</sup> (18 m<sup>2</sup>), respectively for ceiling heights up to and including 30 ft (9.0 m); for ceiling heights over 30 ft (9.0 m) and up to 35 ft (10.7 m) the maximum area spacing of the sprinkler is reduced to 144 ft<sup>2</sup> (13.5 m<sup>2</sup>).

**5. Sprinkler Location from Walls:** Locate the automatic sprinklers with respect to walls, measured perpendicular to the wall, as follows:

Minimum Horizontal Distance: 4 in. (100 mm)

Maximum Horizontal Distance unless indicated otherwise in either the occupancy-specific data sheet or the Approval Guide:

- a. Wall Angle Greater Than 90°: 7 ft (2.1 m) for ceilings up to 30 ft (9.0 m) high or 6 ft (1.8 m) for ceilings over 30 ft (9.0 m) and up to 35 ft (10.7 m) high.
- b. Wall Angle Equal to or Less Than 90°: 10 ft (3.0 m) for ceilings up to 30 ft (9.0 m) high or 8 ft (2.4 m) for ceilings over 30 ft (9.0 m) and up to 35 ft (10.7 m) high.

**6. Sprinkler Location from Ceilings:** Locate the automatic sprinklers with respect to ceilings in accordance with Data Sheet 2-0. However, the minimum vertical distance below a ceiling can be reduced to 2 in. (50 mm) for smooth ceilings or 4 in. (100mm) for non-smooth ceilings.

**7. Obstructions:** Use the obstruction guidelines outlined in D.S. 2-0 for extended coverage automatic sprinklers in regards to the umbrella pattern. In addition, use the obstruction guidelines outlined in D.S. 2-0 for pendent automatic sprinklers in regards to obstructions located below the automatic sprinkler, except that an individual object up to a maximum width of 1.25 in; (31 mm) can be tolerated less than 12 in. (300 mm) horizontally away from the sprinkler as long as the object is located at least 16 in. (400 mm) vertically below the sprinkler.

All other design details should be in accordance with Data Sheet 8-9. All other installation details should be in accordance with Data Sheet 2-0.

8. FM Global considers this a "Quick Response" Extended Coverage Sprinkler for use in Data Sheet 8-9.

9. **For installations governed by NFPA #13**, the N252 EC fire sprinkler meets the definition of Control Mode Specific Application (CMSA) Sprinklers and is approved for installation under Chapter 21 (2013 and 2016 editions) and Chapter 24 (2019 edition), including specific obstruction requirements therein. For deflector distance, follow rules for Extended Coverage Upright and Pendent Sprinklers in appropriate edition of NFPA 13.

## Technical Data

| Sprinkler Model | Type    | Temperature Rating |     | Maximum Ambient Ceiling Temp. |    | Nominal K-Factor GPM/psi (LPM/bar) <sup>1/2</sup> | Orifice Size | Thread Size | Sprinkler Ht. Inch (mm) | Sprinkler Identification Number (SIN) |
|-----------------|---------|--------------------|-----|-------------------------------|----|---|--------------|-------------|-------------------------|---------------------------------------|
|                 |         | °F                 | °C  | °F                            | °C |   |              |             |                         |                                       |
| N252 EC         | Pendent | 165                | 74  | 100                           | 38 | 25.2 (363)  | 1 inch       | 1" NPT (R1) | 3.6 (91,5)              | RA0842                                |
|                 |         | 212                | 100 | 150                           | 66 |   |              |             |                         |                                       |

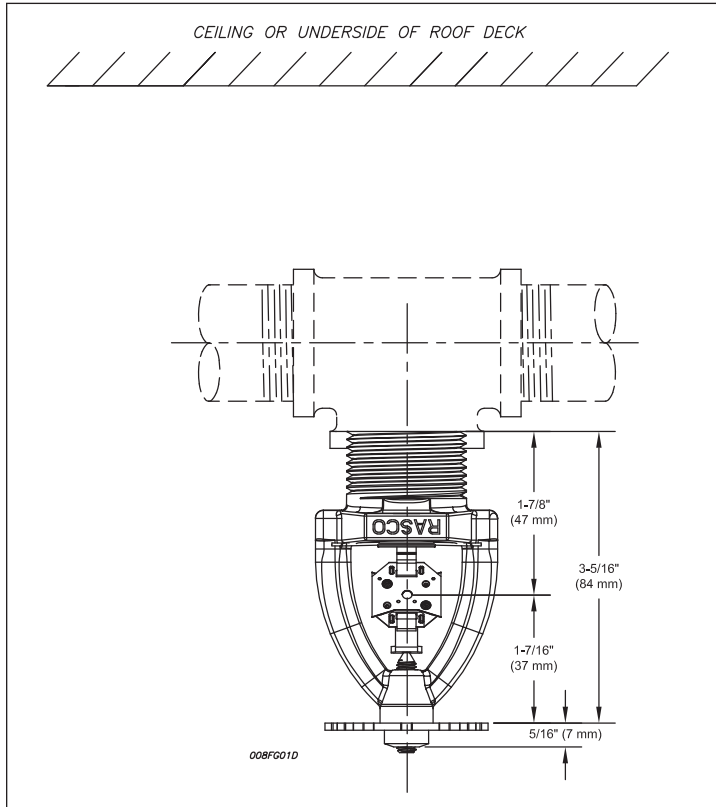


Fig. 1 - Model N252 EC Pendent

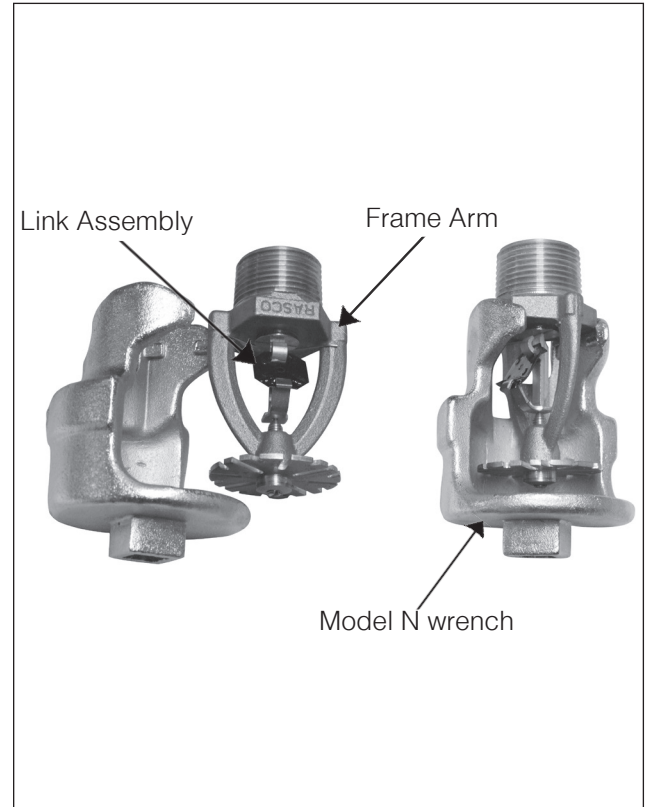


Fig. 2 - Model N Wrench

FM Data Sheet 2 - 0, Ceiling to center of thermal element:  
Maximum 12"



Fig. 3 - Model N1 Wrench

Use only the Model N (Fig. 2) or N1 (Fig. 3) wrenches for installation and removal of the sprinkler. Any other type of wrench may damage the sprinkler.

## Installation

Model N252 sprinklers are to be installed as shown. When handling sprinklers, hold sprinklers only on frame arms and do not apply any force on the link assembly. For installing Model N252 EC pendent sprinklers use only the Model N wrench (Fig. 2). The N1 wrench may also be utilized in all non-recessed installations (Fig. 3). Usage of wrenches other than that specified may damage these sprinklers. Sprinklers should be tightened between 22 to 30 ft.- lbs. (29,8 - 40,7 Nm) torque. Sprinklers not tightened to recommended torque may cause leakage or impairment of the sprinklers. Damaged sprinklers must be replaced immediately.

## Maintenance

The Model N252 EC Pendent Control Mode Specific Application Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, and local jurisdictional requirements. Do not clean sprinklers with soap and water, ammonia, or any other cleaning fluids or solvents. Remove dust by using a soft brush or gentle vacuuming. Remove any sprinkler that has been painted (other than factory-applied) or otherwise altered after leaving the factory. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinkler that would cause improper operation or non-operation.

The tables below represent the minimum number of sprinklers at a minimum start pressure as per FM DS 8-9

**Table 1 - Ceiling - Level protection for Solid Piled, Palletized, Shelf or Bin Box storage arrangements**

| Ceiling Height                  | Class 1, 2 & 3 | Class 4 and Cartoned Unexpanded Plastics | Cartoned Expanded Plastics         | Uncartoned Unexpanded Plastics     | Uncartoned Expanded Plastics       |
|---------------------------------|----------------|--|------------------------------------|------------------------------------|------------------------------------|
| 10' (3.0)                       | N/A            | N/A                                      | 6 @ 20 (1.4)                       | 10 @ 7 (0.5)<br><b>See Note 4</b>  | 10 @ 7 (0.5)<br><b>See Note 4</b>  |
| 15' (4.5)                       | N/A            | 6 @ 20 (1.4)                             | 6 @ 20 (1.4)                       | 12 @ 7 (0.5)<br><b>See Note 4</b>  | 8 @ 20 (1.4)<br><b>See Note 4</b>  |
| 20' (6.0)                       | 6 @ 20 (1.4)   | 6 @ 20 (1.4)                             | 6 @ 20 (1.4)                       | 8 @ 20 (1.4)<br><b>See Note 4</b>  | 8 @ 40 (2.8)<br><b>See Note 4</b>  |
| 25' (7.5)                       | 6 @ 20 (1.4)   | 6 @ 20 (1.4)                             | 6 @ 20 (1.4)                       | 8 @ 40 (2.8)<br><b>See Note 4</b>  | 12 @ 40 (2.8)<br><b>See Note 4</b> |
| 30' (9.0)                       | 6 @ 25 (1.7)   | 6 @ 25 (1.7)                             | 10 @ 40 (2.8)<br><b>See Note 4</b> | 10 @ 40 (2.8)<br><b>See Note 4</b> | N/A                                |
| 35' (10.7)<br><b>See Note 3</b> | 8 @ 40 (2.8)   | 8 @ 40 (2.8)                             | N/A                                | N/A                                | N/A                                |

**Table 2 - Ceiling - Level protection for Open Frame Rack Storage Arrangements**

| Ceiling Height                  | Class 1, 2 & 3 | Class 4 and Cartoned Unexpanded Plastics | Cartoned Expanded Plastics | Uncartoned Unexpanded Plastics     | Uncartoned Expanded Plastics       |
|---------------------------------|----------------|--|----------------------------|------------------------------------|------------------------------------|
| 15' (4.5)                       | N/A            | 6 @ 25 (1.7)                             | 6 @ 25 (1.7)               | 12 @ 40 (2.8)<br><b>See Note 4</b> | 12 @ 40 (2.8)<br><b>See Note 4</b> |
| 20' (6.0)                       | 6 @ 20 (1.4)   | 6 @ 25 (1.7)                             | 6 @ 25 (1.7)               | 6 @ 90 (6.2)                       | N/A                                |
| 25' (7.5)                       | 6 @ 20 (1.4)   | 6 @ 25 (1.7)                             | 6 @ 25 (1.7)               | N/A                                | N/A                                |
| 30' (9.0)                       | 6 @ 30 (2.1)   | 6 @ 30 (2.1)                             | N/A                        | N/A                                | N/A                                |
| 35' (10.7)<br><b>See Note 3</b> | 8 @ 40 (2.8)   | 8 @ 40 (2.8)                             | N/A                        | N/A                                | N/A                                |

**Notes:**

1. See FM Data Sheet 8-1 for definitions of commodity classifications.
2. Per Data Sheet 2-0 Section 2.2.3.4.2 the N252EC defaults to extended coverage and the maximum vertical distance below ceiling is 12" to center of thermal element.
3. For ceiling heights above 30', maximum sprinkler spacing is 12' x 12'.
4. 500 GPM hose stream required.

The equipment presented in this bulletin is to be installed in accordance with the latest published 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 90 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



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Revision lines indicate updated or new data.