**Residential Flat Concealed Sprinkler Pendant, K4.9**

**Model: RD205**

### General Description

The Model RD205 Residential Flat Concealed Sprinklers are automatic sprinklers of the compressed fusible solder type. These are decorative and fast response. The frame of the sprinkler hides the deflector, gasket, etc., which is in turn concealed above the ceiling by the cover plate assembly. The cover plate has a flat profile, and its diameter is extremely small. The push-on/thread-on, thread-off design of the concealed cover plate assembly allows easy installation of the cover plate. Therefore, the Model RD205 should be your first choice when aesthetics is the major consideration for ultimate appeal and unbeatable performance is desired. The Model RD205 is designed for the residential occupancies and it is perfect for use in homes, hotels and other living quarters.

Model RD205 is to be used in wet pipe residential sprinkler systems for one and two family dwellings and manufactured 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 occupancies per NFPA 13. Model RD205 has a 4.9 (70.6 LPM √ / bar) K-factor that meets the required residential flow rates with minimal residual pressure, which allows for smaller pipe sizes and water supply requirements.

For extended installation flexibility, the Model RD205 provides 3/8 inch (9.0mm) vertical adjustment. This adjustment in installation decreases the need for precise cutting of the pipe that drops to the sprinkler and allows for a perfect fit with a range of pipe lengths.

The heat sensitivity and water distribution design of Model RD205 allows for an increased chance of residents' escape or evacuation in case of fire. However, residential fire sprinkler systems are not a substitute for fire safety awareness or fire safety construction required by building codes.

### Technical Data

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approvals</td>
<td>UL Listed</td>
</tr>
<tr>
<td>Sprinkler Identification Number (SIN)</td>
<td>RD205</td>
</tr>
<tr>
<td>Maximum Working Pressure</td>
<td>175 psi (12.1 bar)</td>
</tr>
<tr>
<td>Discharge Coefficient</td>
<td>K70 (K4.9)</td>
</tr>
</tbody>
</table>
| Temperature Rating | Sprinkler: 162°F / 72°C  
Cover Plate: 140°F /60°C |
| Vertical Adjustment | 3/8 inch (9.0 mm) |
| Finishes | White Painted, Chrome and Custom painted |
| Physical Characteristics | Ref. Figure 1 |

### Warnings

The Model RD205 must be installed and maintained in accordance with the rules stated herein as well as in compliance with the applicable standards of the National Fire Protection Association regulations and the standards of any other authorities having jurisdiction. In the event of this condition, consult the authorities having jurisdiction for guidance and approval. Failure to do so may impair the integrity of these devices.

It is the responsibility of the installing contractor to provide a copy of this document to the owner or his representative, and in turn, it is the obligation of the owner to provide a copy of this document to a succeeding owner. 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 with any related questions.
Operation

In case of fire, the solder component that holds together the Cover Plate and the Retainer melts and as a result the Cover Plate is released. The two Heat Collectors are exposed and when sufficient heat from the fire is recorded, internal components of the sprinkler to fall apart. This leads to the dropping of the Deflector into its operating position, allowing the water flow to be distributed on the affected by fire area. (Ref. Figure 2)

Design Criteria

The herein stated rules for use and installation of Model RD205 are provided by the manufacturer and must be strictly implemented for safe and full results.

Notes

Residential Fire Sprinkler Systems should only be designed and installed by individuals who are completely familiar with automatic sprinkler system design, installation procedures, and techniques. 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 coverage by the following instructions, should be submitted to Rapidrop Ltd. 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, 13D, or 13R, or by the authority having jurisdiction. The Model RD205 must not be used in applications where the air pressure above the ceiling is greater than that below. The spray from the sprinkler is distributed radically outward and downward from the sprinkler deflector. Consequently, the sprinklers must be located such that there will be no blind spaces shielded from spray by partitions, room dividers, overhangs or other parts of the dwelling structure.

The number of sprinklers within each compartment (as defined by NFPA 13, 13D, or 13R) must be kept as small as possible. Do NOT use more sprinklers than necessary to cover a particular space. Use only the Cover Plate provided with the Model RD205. The sprinkler must be secured in place 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.

Obstruction to Water Distribution

Locations of sprinklers must follow the obstruction rules of NFPA 13 for Residential Sprinklers.

General Service Conditions

The Model RD205 must only be utilized in WET PIPE sprinkler systems.

Heat Source Criteria

Refer to NFPA 13D or 13R for the requirements relating to the prevention of possible activation of the Heat Responsive Element of Model RD205, due to exposure to a heat sources other than an actual fire.

Precautionary Warnings for Corrosive Environments

The Model RD205 should not be installed where they may be subjected to a corrosive environment including the following:

1) Chlorine ion and Chloride environment

Stress corrosion cracking may be caused by exposure to environments with Chlorine ion and Chloride. Exposure to this environment may result in sprinklers operating under Non-Fire conditions or Not Operating when exposed to an actual fire.

2) Sprinkler system piping with Copper

Sprinkler systems should be constructed in compliance with the applicable standards and the requirements for the copper piping when copper piping is used in the sprinkler system. (Reference standards NFPA 13, ASTM B813, B828, and CDA (Copper Development Association) – Solder Joint) All residual flux must be removed from the interior and exterior of copper piping by thoroughly flushing before installation of the Sprinkler Heads. Otherwise, residues of flux may cause corrosion and leakage in the sprinkler system.
### Hydraulics Design Criteria

**Title**: NFPA 13D and NFPA 13R Wet Pipe Hydraulic Design Criteria

<table>
<thead>
<tr>
<th>Maximum Coverage Area (\text{ft.} \times \text{ft.} \ (m \times m))</th>
<th>Spacing (between the Sprinklers)</th>
<th>Minimum Flow(^{(b)}) and Residual Pressure for Horizontal Ceiling ((\text{Max.} \ 2\ \text{inch Rise for} \ 12\ \text{inch Run}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 x 12 ((3.7 \times 3.7))</td>
<td>12 ft. ((3.7m))</td>
<td>13 GPM ((49.2 \text{ LPM}))</td>
</tr>
<tr>
<td>14 x 14 ((4.3 \times 4.3))</td>
<td>14 ft. ((4.3m))</td>
<td>14 GPM ((53.0 \text{ LPM}))</td>
</tr>
<tr>
<td>16 x 16 ((4.9 \times 4.9))</td>
<td>16 ft. ((4.9m))</td>
<td>15 GPM ((56.8 \text{ LPM}))</td>
</tr>
<tr>
<td>18 x 18 ((5.5 \times 5.5))</td>
<td>18 ft. ((5.5m))</td>
<td>19 GPM ((71.9 \text{ LPM}))</td>
</tr>
</tbody>
</table>

**Notes**

- For coverage area dimensions less than the above mentioned, it needs to use the minimum required flow for the Next Higher Coverage Area listed.
- Requirement is based on minimum flow in GPM/LPM from each sprinkler. The associated residual pressures are calculated using the nominal K-Factor. Refer to Hydraulic Design Criteria Section for details.

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### Sprinkler Spacing Criteria

The minimum spacing between sprinklers is 8 feet \((2.4m)\). The maximum spacing between sprinklers cannot go beyond the coverage area calculated by using the specific hydraulic factors. \(\text{Ref. Table A}\)

### Installation

The Model RD205 must be installed in accordance with the following instructions.

#### Notes

Do not use any sprinklers which have been subjected to potential mechanical damage. Do not use any sprinklers which show deformation or cracking in either the Sprinkler or the Protective Cap. Prior to installation, sprinklers 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.

The Protective Cap must remain on the sprinkler during installation and until the ceiling installation is completed. The Protective Cap must be removed to place the sprinkler in service.

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### Installing Procedure

**Step 1**

The installation requirements for the sprinkler are as follows: to be installed only in the pendent position with the waterway perpendicular to the ceiling. Install the sprinkler fitting so that the distance from the face of the fitting to the mounting surface will be nominally 1- 7/8 inch \((47.6 \text{ mm})\) as shown in Figure 3.

**Step 2**

With pipe thread sealant applied to the threads, hand tighten the sprinkler into the sprinkler fitting. Then tighten it with the Sprinkler Socket or Wrench & Socket Combination \(\text{Ref. Figure 4}\). The grooves of the Socket must fit perfectly with the grooves on the Sprinkler for proper installation \(\text{Ref. Figure 4}\).

**Step 3**

If desired the Protective Cap may also be used to locate the center of the clearance hole by gently pushing the ceiling material against the center point of the Protective Cap. Before the installation of the ceiling, the sprinkler installation can be started with the 2 inch \((50 \text{ mm})\) diameter clearance hole \(\text{Ref. Figure 3}\). Use the “Tolerance Limit of Ceiling Level” indicator on the Protective Cap to check for proper installation height \(\text{Ref. Figure 3}\).
Step 4
Use the Protective Cap Removal Tool to remove the Protective Cap (Ref. Figure 5) and then push/screw a Cover Plate Assembly on the frame of the Sprinkler by hand until its flange just comes in contact with the ceiling (Ref. Figure 6 and Figure 7). Stop tightening the Cover Plate Assembly once the flange has come in contact with the ceiling. If the ceiling has been lifted from its normal position in the process of tightening of the Cover Plate Assembly, readjust the cover plate assembly as necessary. If the flange of the Cover Plate Assembly cannot come in contact with the ceiling sufficiently, readjust the sprinkler fitting as necessary. When properly installed, there is a nominal 1/8 inch (3.2mm) air gap between the lip of the Cover Plate and the ceiling, as shown in Figure 6.
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Care and Maintenance

The following instructions must be implemented for the maintenance and service of the Model RD205.

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 can result.
- Absence of a Cover Plate Assembly may delay the response time of the sprinkler in case of fire.
- Install the cover plate assembly properly, as shown in Figure 6. Improper installation of the cover plate assembly may cause improper operation or non-operation.
- If the ceiling is to be repainted after the installation of the Sprinkler, care must be exercised to ensure that the new paint does not seal off any of the air gap.
- Factory painted Cover Plates must not be repainted. They should be replaced, if necessary, by factory painted cover plates. Non-factory applied paint may adversely delay or prevent sprinkler operation in case of a fire.
- Do not pull the Cover Plate. Separation may result.
- In preparation for maintenance of the fire protection system, permission to close the main control valve must be obtained from the proper authorities and all affected by this action must be informed before the maintenance session can commence.
- Do NOT hang anything from the sprinklers.
- Do NOT clean 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 these materials can reduce the ability of the sprinkler systems to aid in the control of a fire involving such hazards.
- Automatic Sprinklers must never be shipped or stored where the temperature exceeds 100°F/38°C.

Order Procedure

When placing an order, please contact a local distributor with the following information (Specify Model, Name and Item Number):

Sprinkler Model:
RD205 (SIN:RD205, Residential Flat Concealed Sprinkler, Pendent, K4.9, Temp.: 162°F / 72°C)

Cover Plate Assembly:
(2-3/8inch (60mm), Temp.: 140°F/60°C Order Separately from Sprinkler)

Finish: White painted, Chrome and Custom painted

Tools for Installation of Model RD205:
Socket for Model RD205
Ratchet Wrench & Socket for Model RD205
Protective Cap Removal Tool for Model RD205