Type EA-1 PROTECTOSPRAY
Directional Spray Nozzles, Automatic, Medium Velocity

General Description
The TYCO Type EA-1 PROTECTOSPRAY Directional Spray Nozzles are automatic (frangible bulb) directional spray nozzles designed for use in water spray fixed systems for fire protection applications. They are external deflector-type nozzles that discharge a uniformly filled cone of medium velocity water droplets.

The Type EA-1 PROTECTOSPRAY Directional Spray Nozzles are effective in covering exposed vertical, horizontal, curved, and irregular shaped surfaces in a cooling spray to prevent excessive absorption of heat from an external fire and possible structural damage or spread of fire to the protected equipment. However, use of an automatic nozzle requires consideration of the response time of the thermal element.

The Type EA-1 PROTECTOSPRAY Directional Spray Nozzles are especially effective for area coverage and are sometimes used in lieu of standard sprinklers where directional spray is considered more appropriate. In some applications, depending on water design density requirements, the Type EA-1 Nozzles are also used for fire control or extinguishment.

The Type EA-1 PROTECTOSPRAY Directional Spray Nozzles are available in three orifice sizes and a wide variety of spray angles (included angle of discharge), as well as temperature ratings to provide versatility in system design. It is recommended that the end user be consulted with respect to the suitability of the materials of construction and finish for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity should be considered, at a minimum, along with the corrosive nature to which the sprinklers may be exposed.

The Type EA-1 PROTECTOSPRAY Directional Spray Nozzle is a re-designation for the Gem Type EA-1.

NOTICE
The Type EA-1 PROTECTOSPRAY Directional Spray Nozzles 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 authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The design of individual water spray fixed systems can vary considerably, depending on the characteristics and nature of the hazard, the basic purpose of the spraying system, the configuration of the hazard, and wind/draft conditions. Because of these variations, as well as the wide range of available nozzle spray characteristics, the design of water spray fixed systems for fire protection must only be performed by experienced designers who thoroughly understand the limitations as well as capabilities of such systems.

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 questions.

Technical Data

Approvals
UL and C-UL Listed
FM Approved

Maximum Working Pressure
175 psi (12,1 bar)
(Also refer to Figure 2, Note 2)

Discharge Coefficient
Refer to Table A

Spray Angles
Refer to Table B

Temperature Rating
Refer to Table C

Finish and Material
Refer to Table D

Thread Connection
1/2 inch NPT

Physical Characteristics
Frame .............................................. Bronze
Bushing (K=1,4 & K=2,8) ................. Brass
Deflector ...................................... Bronze
Pin .............................................. Brass
Bulb (11 mm dia.) .......................... Glass
Bulb Seats .................................... Bronze
Spacer ....................................... Bronze
Button ....................................... Bronze
Spring Plates ................................. Inconel
Gaskets ..................................... Copper

IMPORTANT
Always refer to Technical Data Sheet TFP700 for the “INSTALLER WARNING” that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.
**Operation**

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the nozzle to activate and water to flow.

**Design Criteria**

**Nozzle Placement**

Where direct impingement of water spray onto all of the protected surface is required by the authority having jurisdiction, the nozzles are to be spaced and directed so that their spray patterns will completely cover the plane-of-protection with the minimum required average density. However, it is recommended that indoor nozzle spacing be 12 feet (3.7 m) or less and that outdoor nozzle spacing be 10 feet (3.0 m) or less. Where rundown or slippage is planned, for example, exposure protection of vessels per NFPA 15, the above recommended indoor and outdoor spacings also apply.
When used for protecting the surfaces of a vessel, for example, the nozzles are positioned normal to and approximately 2 feet (0.6 m) from the surface. This approach, in conjunction with a properly selected spray angle, will tend to make more effective use of the spray as well as help minimize the disturbance effects of wind/draft conditions on the water spray patterns.

**Spray Patterns**
The Design Spray Profiles for the nozzle spray angles of 65 to 180 degrees are shown in Figure 2 and apply to discharge pressures of 20 to 60 psi (1.4 to 4.1 bar). Discharge pressures in excess of 60 psi (4.1 bar) will result in a decrease in coverage area because the spray patterns tend to draw inwards at higher pressures. Refer inquiries on higher discharge pressures to the Technical Services Department.

The maximum axial distances between the nozzle tip and plane-of-protection, for exposure protection, are given in Table E and F. When the axial distance from the nozzle tip to the plane-of-protection is 2 feet (0.6 m) or less, the Design Spray Profile is the same as the nominal spray angles of 65 thru 140 degrees.

**Heat Sensitivity**
Because the Type EA-1 PROTECTOSPRAY Directional Spray Nozzles are automatic nozzles, they must be located with consideration of their ability to detect abnormal temperature increases due to fire. Therefore, it is recommended that NFPA 13 be reviewed with respect to the rules that define the permitted distance below ceilings and the spacing limitations for standard coverage automatic sprinklers as a function of occupancy hazard.

**Main Pipeline Strainers**
Main pipeline strainers per NFPA 15 are required for systems utilizing nozzles with a flow path less than 3/8 inch (9.5 mm) diameter, that is, $K=1.4$ and $K=2.8$ (Table A), and for any system where the water is likely to contain obstructive material.

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**Notes:**
1. Design data obtained from tests in still air.
2. Design data applies to a residual (flowing) pressure range at the nozzle inlet of 20 to 60 psi (1.4 to 4.1 bar). For pressures up to 175 psi (12.1 bar) consult Tyco Fire Protection Products Technical Services.
   Refer to the authority having jurisdiction for their minimum required residual pressures.
3. The shapes of the Design Spray Profiles remain essentially unchanged over the maximum Axial Distances shown in Tables E and F.
4. For axial distances of 2 feet (0.6 meters) and less and for nozzle spray angles of 65° to 140°, the Design Spray Profile is the same as the nominal spray angle.
5. The maximum Axial Distances shown in Tables E and F are based on exposure protection.
**Installation**

The TYCO Type EA-1 PROTECTOSPRAY Directional Spray Nozzles must be installed in accordance with this section.

**NOTICE**

Do not install an Type EA-1 Nozzle 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 3/32 inch (2.4 mm) for the 135°F (57°C) to 1/4 inch (6.4 mm) for the 500°F (260°C) temperature ratings.

Obtain a leak-tight 1/2 inch NPT nozzle joint by applying a minimum-to-maximum torque of 7 to 14 ft.-lbs. (9.5 to 19.0 Nm). Higher levels of torque can distort the nozzle inlet and cause leakage or impairment of the nozzle.

**Step 1.** With pipe-thread sealtant applied to the pipe threads, hand-tighten the nozzle into the nozzle fitting.

**Step 2.** Tighten the nozzle into the nozzle fitting using only the W-Type 11 Sprinkler Wrench (Figure 3), except that an 8 or 10 inch adjustable crescent wrench is to be used for wax-coated nozzles. With reference to Figure 1, the W-Type 11 Sprinkler Wrench or the adjustable crescent wrench, as applicable, is to be applied to the wrenching area.

When installing wax-coated nozzles with the adjustable crescent wrench, exercise additional care to prevent damage to the wax coating on the nozzle wrenching area or frame arms and, consequently, exposure of bare metal to the corrosive environment. Sufficiently widen the jaws of the wrench enough to pass over the wrenching area without damaging the wax coating. Before wrench-tightening the nozzle, adjust the jaws of the wrench to contact the nozzle wrenching area. After wrench-tightening the nozzle, loosen the wrench jaws before removing the wrench.

After installation, inspect the nozzle wrenching area and frame arms and retouch (repair) the wax coating wherever the coating has been damaged and bare metal is exposed. Retouch the wax coating on the wrenching area by gently applying a heated 1/8 inch diameter steel rod to the areas of wax that have been damaged, smoothing it back over areas where bare metal is exposed.

**NOTICE**

Only retouching of the wax coating applied to the wrenching area and frame arms is permitted, and the retouching is to be performed only at the time of the initial nozzle installation.

The steel rod should be heated only to the point at which it can begin to melt the wax, and appropriate precautions need to be taken when handling the heated rod in order to prevent the installer from being burned.
### Care and Maintenance

The TYCO Type EA-1 PROTECTOSPRAY Directional Spray Nozzles must be maintained and serviced in accordance with this section.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection system or the like.

### Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.
Ordering Procedure

When placing an order, indicate the full product name and part number (P/N). Contact your local distributor for availability.

Type EA-1 PROTECTOSPRAY Directional Spray Nozzle
Specify:
- (1.4, 2.8, or 5.6) K-factor orifice
- temperature rating
- finish/coating and material
- (degree) spray angle
- P/N (from Table G)

Sprinkler Wrench
Specify: W-Type 11 Sprinkler Wrench, P/N 56-452-1-001

Table G
TYPE EA-1 PROTECTOSPRAY DIRECTIONAL SPRAY NOZZLES
PART NUMBER SELECTION