

## Type HV Directional Spray Nozzles, Open, High Velocity

### General Description

The Type HV Nozzles are open (non-automatic) directional spray nozzles with individual inlet strainers. They are designed for use in water spray fixed systems for fire protection applications where a high velocity water application may be required, such as for the protection of flammable liquids.

The Type HV Nozzles feature an integral strainer for use when the Authority Having Jurisdiction (other than NFPA applications) requires the use of individual strainers in addition to main pipeline strainers for nozzles having an orifice diameter of 3/8 inch (9,5 mm) or less.

Available in brass or stainless steel, the six patterns of the Type HV Nozzles provide a wide variety of orifice sizes and distribution characteristics. As water passes through the internal swirl plate, a swirling action is produced, prior to the water being discharged through the orifice tip of the body, resulting in a solid conical spray pattern of water droplets being discharged over a defined area.

High velocity type nozzles are principally used in water spray systems for the protection of fixed hazards such as

transformers, circuit breakers, diesel engines and diesel storage tanks, turbo alternators, lube oil systems, oil fire boilers, and similar hazards. They are capable of rapidly extinguishing oil fires by emulsification, cooling, and smothering. The surface cooling effects of high velocity type nozzles also minimizes the possibility of reignition after a fire extinguishment.

It is recommended that the end user be consulted with respect to the suitability of the materials of construction 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 nozzles may be exposed.

The Type HV Nozzles are a redesignation for the Gem Type HV.

#### WARNINGS

*The Type HV 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 other 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 de-*



*vices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.*

#### 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 nozzle to fail to operate in a fire situation.*

# Technical Data

## Approvals

The Type HV Nozzles are UL and ULC Listed, as well as FM Approved.

## Maximum Working Pressure

175 psi (12,1 bar).  
Also refer to Figure 2, Note 2.

## Discharge Coefficient

Refer to Figure 1.

## Water Distribution

Refer to Figure 2 and 3. Optimum flowing pressure is 30 to 80 psi (2,1 to 5,5 bar).

## Thread Connection

Refer to Figure 1.

## Physical Characteristics (Brass Assemblies)

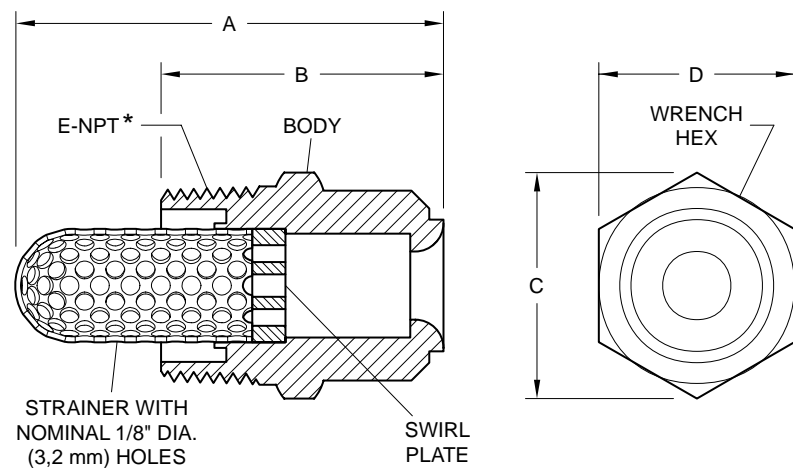
- Body . . . . . Brass
- Swirl Plate . . . . . Brass
- Strainer . . . . . Brass
- Strainer . . . . . Copper

## Physical Characteristics (Stainless Steel Assemblies)

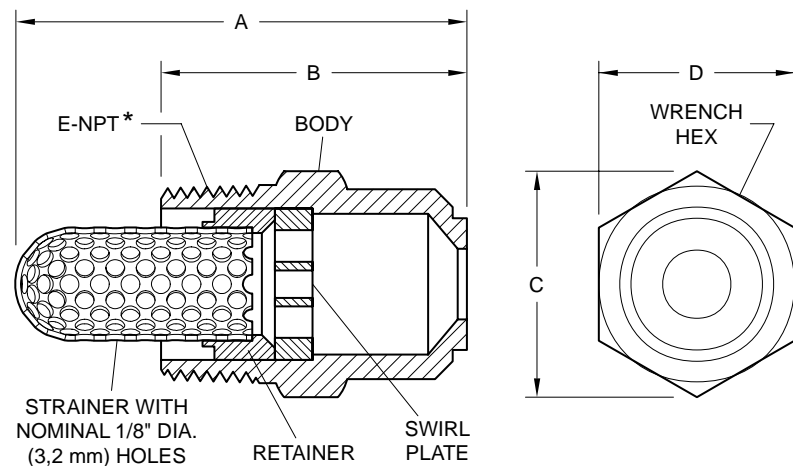
- Body . . . . . Type 316
- Swirl Plate . . . . . Type 316
- Strainer . . . . . Type 316
- Strainer . . . . . Type 316L

TYPE	K-FACTOR		Nominal Dimensions in Inches and (mm)				
	NFPA (GPM ÷ √psi)	ISO/SI (LPM ÷ √bar)	A	B	C	D	E-NPT*
HV-14	1.6	23,0	2.83 (71,9)	1.87 (47,1)	1.50 (38,1)	1.30 (33,0)	1
HV-17	1.8	25,9	2.83 (71,9)	1.87 (47,1)	1.50 (38,1)	1.30 (33,0)	1
HV-26	2.8	40,3	2.83 (71,9)	1.87 (47,1)	1.50 (38,1)	1.30 (33,0)	1
HV-37	4.6	66,2	3.00 (76,2)	2.03 (51,6)	1.50 (38,1)	1.30 (33,0)	1
HV-45	5.5	79,2	3.00 (76,2)	2.03 (51,6)	1.50 (38,1)	1.30 (33,0)	1
HV-60	6.4	92,2	4.56 (115,8)	3.41 (86,6)	1.90 (48,3)	1.65 (41,9)	1-1/4

\* Pipe thread connections per ISO 7/1 can be provided on special request.

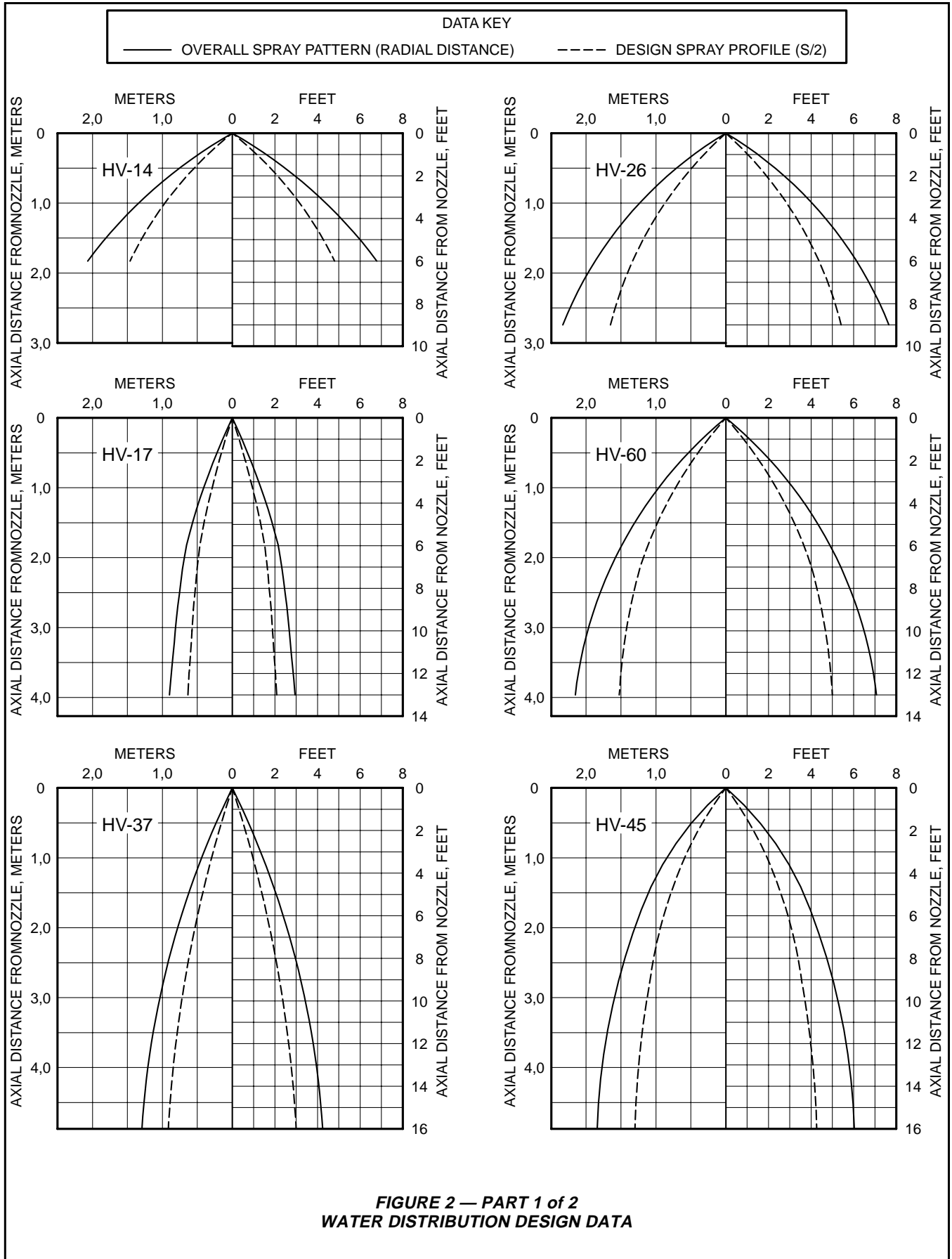


TYPE HV-14, HV-17, AND HV-26



TYPE HV-37, HV-45, AND HV-60

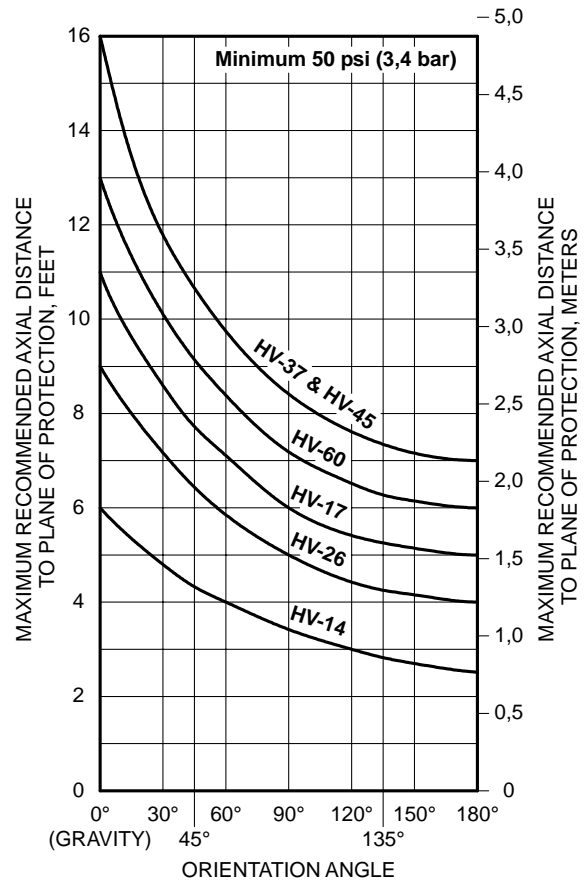
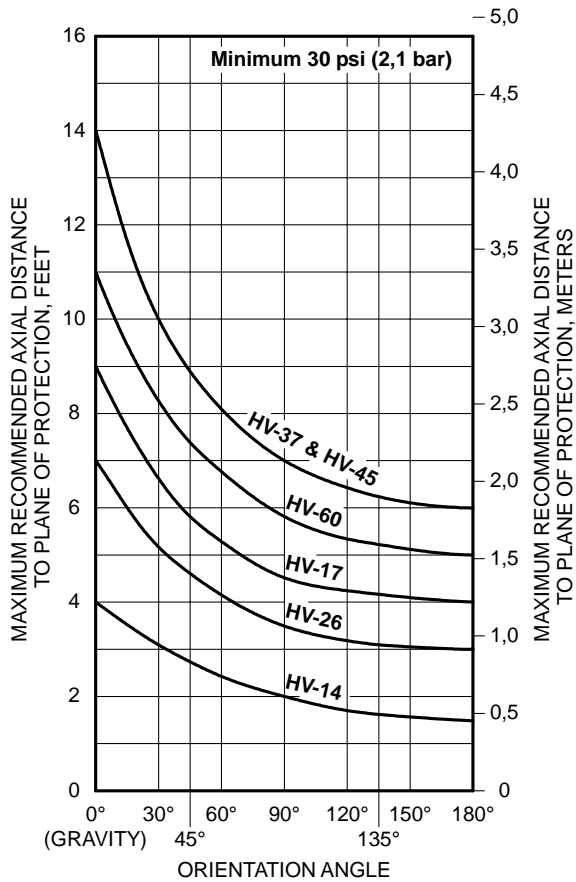
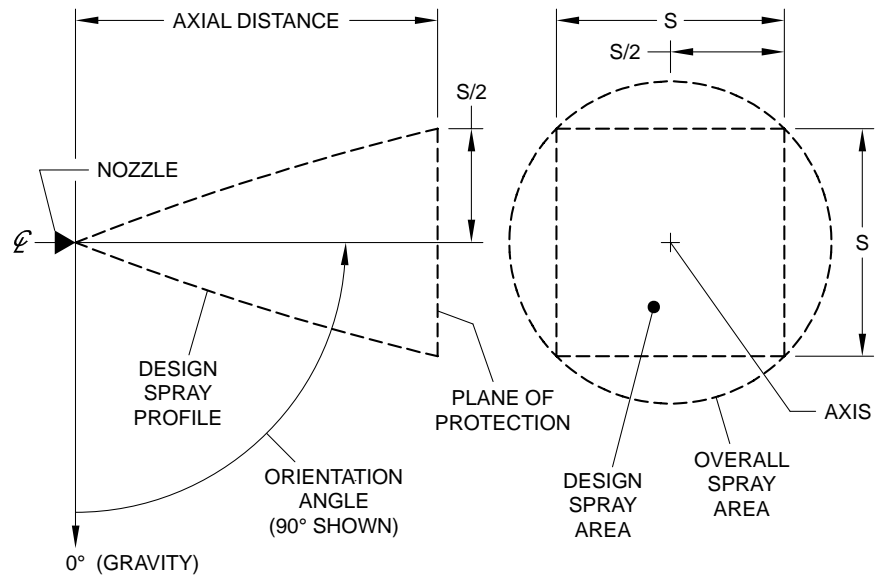
**FIGURE 1  
TYPE HV NOZZLES  
NOMINAL DIMENSIONS**



**FIGURE 2 — PART 1 of 2**  
**WATER DISTRIBUTION DESIGN DATA**

**NOTES (Figures C-1 and C-2):**

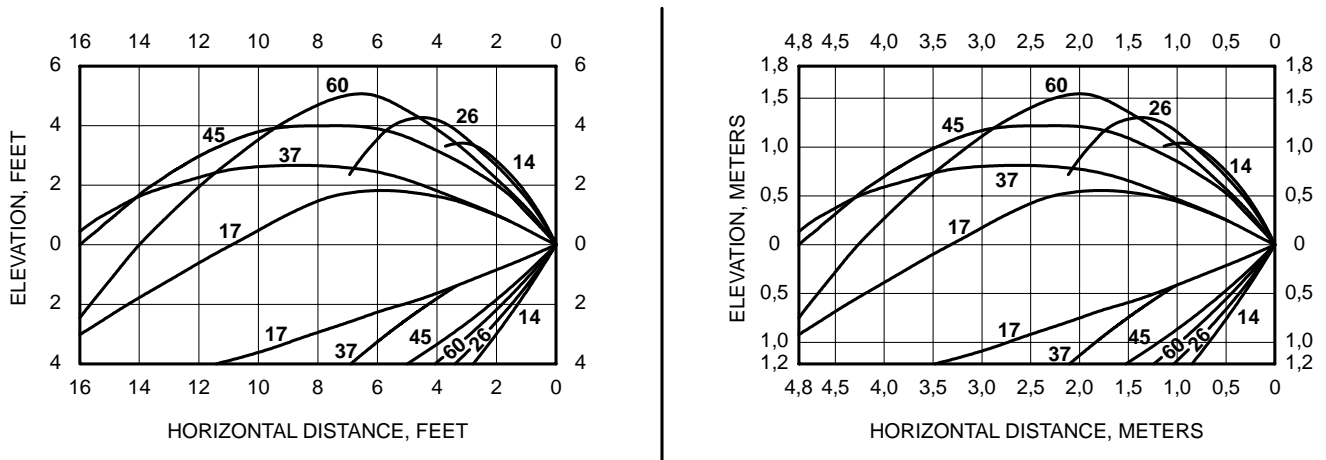
1. Design data applies to a maximum wind condition of 15 MPH (24 km/h).
2. Unless otherwise noted, design data applies to a residual (flowing) pressure range at the nozzle inlet of 30 to 80 psi (2,1 to 5,5 bar). For pressures up to 175 psi (12,1 bar) consult Tyco Fire & Building Products Technical Services.
3. The shapes of the Overall Spray Patterns and Design Spray Profiles remain essentially unchanged over the maximum recommended axial distances.



**FIGURE 2 — PART 2 of 2  
WATER DISTRIBUTION DESIGN DATA**

## NOTES:

1. Reference data applies to still air.
2. The Overall Spray Patterns in the plan view are the same as those in Figure C-1.



**FIGURE 3**  
**REFERENCE GUIDE SHOWING THE OVERALL VERTICAL SPRAY PATTERNS**  
**WHEN PROJECTING WATER HORIZONTALLY BEYOND THE DESIGN PARAMETERS GIVEN IN FIGURE 2**  
**— 30 to 80 PSI (2,1 to 5,5 bar) —**

## Design Criteria

**Nozzle Placement.** The nominal overall spray patterns, spacing, and maximum recommended axial distances for six patterns of the Type HV Nozzles are given in Figure 2 for residual (flowing) pressures of 30 to 80 psi (2,1 to 5,5 bar). A minimum residual pressure of 30 psi (2,1 bar) can typically be used for most applications; however, a minimum residual pressure of 50 psi (3,4 bar) is recommended for applications requiring higher velocity water delivery, such as those specifying rapid extinguishment of oil fires by emulsification.

With reference to Figure 2, use of the "Design Spray Profile" for the "Design Spray Area" will help assure that direct impingement on all surfaces will occur. The "Design Spray Area" shown at the top Figure 2 - Part 2 of 2 on Page 4 consists of the square of length "S" within the circular "Overall Spray Area".

The maximum recommended axial distances given in Figure 2 are based on maintaining the specified spray patterns under a maximum wind condition of 15 MPH (24 km/h).

Figure 3 provided a reference guide showing the overall still air spray patterns beyond the maximum 15 MPH (24 km/h) axial distances, when pro-

jecting horizontally. As shown in Figure 3, the spray patterns become non-concentric, beyond a certain point, due to the affects of gravity.

**Main Pipeline Strainers.** Even though individual strainers have been provided, main pipeline strainers are required for systems utilizing Type HV Nozzles, since their waterways are less than 3/8 inch (9,5 mm) diameter.

## Installation

Type HV Nozzles must be installed in accordance with the following instructions:

### NOTE

*A leak tight 1 inch NPT nozzle joint should be obtained with a torque of 20 to 30 ft.lbs. (26,8 to 40,2 Nm). A leak tight 1-1/4 inch NPT nozzle joint should be obtained with a torque of 30 to 40 ft.lbs. (40,2 to 53,6 Nm). Higher levels of torque may distort the nozzle inlet and cause impairment of the nozzle.*

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

**Step 2.** Tighten the nozzle into the nozzle fitting using an adjustable crescent wrench. With reference to Figure 1 the adjustable crescent wrench is to be applied to the wrench hex.

## Care and Maintenance

The Type HV Nozzles must be maintained and serviced in accordance with the following instructions:

### NOTE

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

Type HV Nozzles must never be painted, plated, coated or altered in any way after leaving the factory; otherwise, the spray performance may be impaired.

Care must be exercised to avoid damage to the nozzles - before, during, and after installation. Nozzles damaged by dropping, striking, wrench twist/slip-page, or the like, must be replaced.

Frequent visual inspections are recommended to be initially performed for nozzles installed in potentially corrosive atmospheres to verify the integrity of the materials of construction as they may be affected by the corrosive conditions present for a given installation. Thereafter, annual inspections per NFPA 25 are required.

Water spray fixed systems for fire protection service require regularly scheduled care and maintenance by trained personnel. In addition to inspecting nozzles for proper spray performance during water flow trip tests of the system, it is recommended that nozzles be periodically inspected for broken or missing parts or evidence of impaired protection. The inspections should be scheduled weekly or as frequently as may be necessary, and corrective action must be taken to ensure that the nozzles will perform as intended in the event of a fire.

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 water spray fixed systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

## Limited Warranty

Products manufactured by Tyco Fire & Building Products (TFBP) 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 TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP 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 TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFBP was informed about the possibility of such damages, and in no event shall TFBP's liability exceed an amount equal to the sales price.

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.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

## Ordering Procedure

When placing an order, indicate the full product name and P/N.

Contact your local distributor for availability.

### HV Nozzles:

Specify: Type (number), (specify brass or stainless steel) Nozzle with (specify NPT or ISO 7/1) thread connection, P/N (specify).

### Brass Assemblies, NPT

HV-14	P/N 49-014-1-001
HV-17	P/N 49-016-1-001
HV-26	P/N 49-026-1-001
HV-37	P/N 49-037-1-001
HV-45	P/N 49-045-1-001
HV-60	P/N 49-060-1-001

### Stainless Steel Assemblies, NPT

HV-14	P/N 49-014-0-001
HV-17	P/N 49-016-0-001
HV-26	P/N 49-026-0-001
HV-37	P/N 49-037-0-001
HV-45	P/N 49-045-0-001
HV-60	P/N 49-060-0-001

### Brass Assemblies, ISO 7/1

HV-14	P/N PBP55062
HV-17	P/N PBP55071
HV-26	P/N PBP55080
HV-37	P/N PBP55099
HV-45	P/N PBP55101
HV-60	P/N AEC00236

### Stainless Steel Assemblies, ISO 7/1

HV-14	P/N AEC00012
HV-17	P/N AEC00021
HV-26	P/N AEC00030
HV-37	P/N AEC00049
HV-45	P/N AEC00058
HV-60	P/N AEC00263