

## Model TCV-1 Thermal Control Valve 1 and 1-1/2 Inch (DN25 and DN40), 175 psi (12,1 bar) Thread x Thread

### General Description

The 1 and 1-1/2 inch (DN25 and DN40) Model TCV-1 Thermal Control Valves are small deluge valves with a self-contained heat actuating unit. They are designed for use as a system control valve for isolated deluge fire protection systems of limited size, wherein the valve is located within the area to be protected. The TCV-1 is typically used as an auxiliary deluge valve to control the flow of water to specific areas within a larger wet pipe, dry pipe, or deluge system.

The Model TCV-1 Thermal Control Valve is a direct replacement for the Gem Model F430 Thermal Control Valve and a redesignation for the Gem Model F431 Thermal Control Valve.

#### WARNING

*The Model TCV-1 Thermal Control Valves 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 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.*

*An adequate supply of spare Valve Actuating Units must be maintained on hand, in order to minimize the time that the system is out of service following an operation.*

### Technical Data

**Approvals:**  
UL and C-UL Listed. FM Approved.

**Working Pressure Range:**  
20 to 175 psi (1,4 to 12,1 bar).

**Temperature Ratings:**  
165°F/74°C (For use in maximum 100°F/38°C ambient temperature conditions).

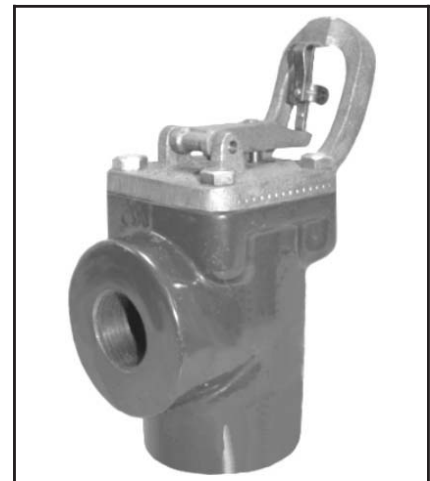
212°F/100°C (For use in maximum 150°F/66°C ambient temperature conditions).

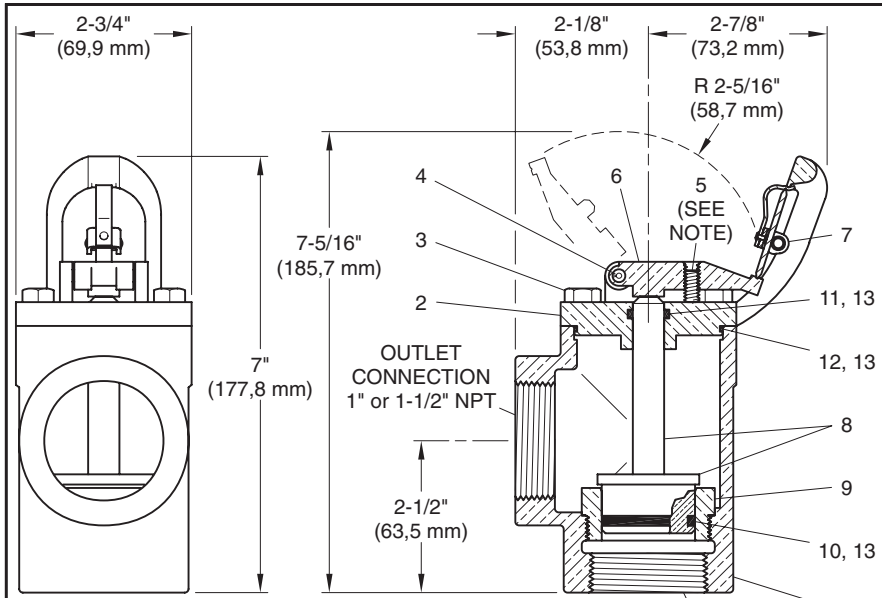
**Pressure Loss:**  
See Figure 3.

#### Construction (Ref. Figure 1:

The Body Assembly (1,9) has a cast iron Body and the bronze Seat Ring. The Plug Valve Assembly (8) consists of a bronze Valve Stem and a bronze Plug with a silicone elastomer seal (10). The replaceable Valve Actuating Unit (2, 4, 5, 6, 7, 11, 12, 13) consists of a bronze Top with silicone elastomer seals and a solder type Fusible Assembly mounted with a bronze Lever and stainless steel Spirol Pin.

The Valve Actuating Unit is assembled to the Body Assembly with four brass Cap Screws, and the Top adjacent to the Fusible Link is color coded — plain for 165°F/74°C or white for 212°F/100°C.





NOTE: SET SCREW, ITEM 5, IS FACTORY SEALED WITH LEAD IN VALVE LEVER, ITEM 6, AFTER TENSION ON FUSIBLE ASSEMBLY, ITEM 7, IS ADJUSTED

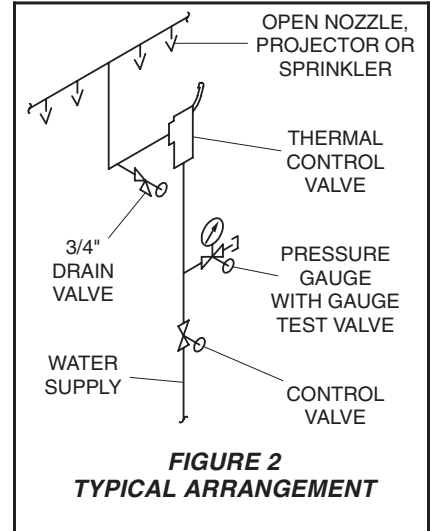
NO.	DESCRIPTION	QTY.	REF.
1	Valve Body	1	NR
2	Top	1	See (b)
3	5/16-18 UNC x 3/4" Hex Head Cap Screw, Brass	4	CH
4	Spirol Pin	1	See (b)
5	Set Screw	1	See (b)
6	Valve Lever	1	See (b)
7	Fusible Assembly, 165°F/74165°C or 212°F/100212°C	1	See (b)
8	Plug Valve Assembly	1	See (a)
9	Seat Ring	1	NR
10	O-Ring	1	See (b)
11	O-Ring	1	See (b)

NO.	DESCRIPTION	QTY.	REF.
12	O-Ring	1	See (b)
13	Dow Corning FS3452 Fluorosilicone Grease, 1.5 g	1	See (b)

NR: Not Replaceable  
CH: Common Hardware

REPLACEMENT PARTS		
NO.	DESCRIPTION	P/N
(a)	Plug Valve Assembly	92-010-1-006
(b)	Replacement Valve Actuating Unit Includes Items 2, 4-7, 10-13	
	Temperature Rating:	
	165°F/74165°C	52-011-1-001
	212°F/100212°C	52-011-1-002

**FIGURE 1**  
**1 and 1-1/2 INCH (DN25 and DN40)**  
**MODEL TCV-1 THERMAL CONTROL VALVE**



**FIGURE 2**  
**TYPICAL ARRANGEMENT**

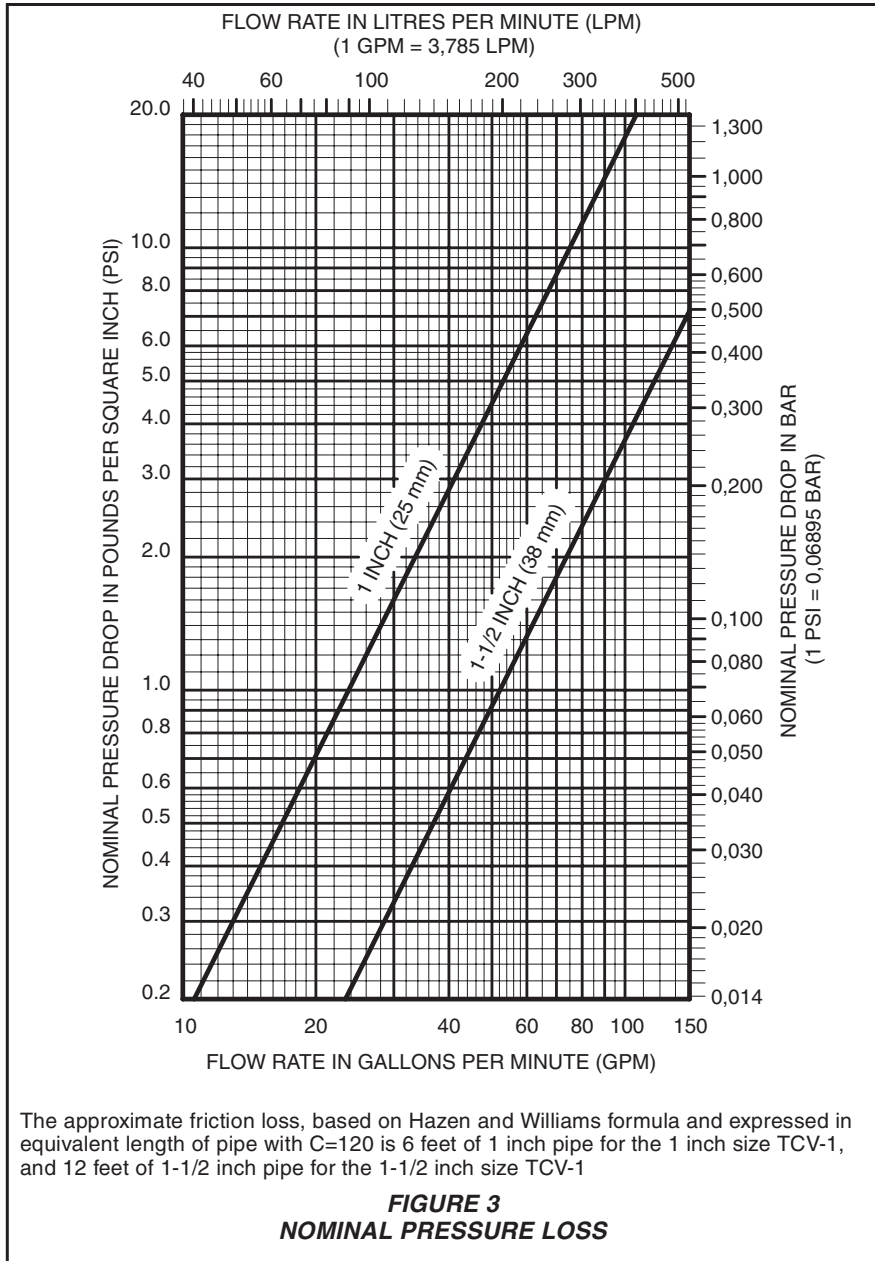
## Design Considerations

Figure 2 illustrates the typical arrangement for the Model TCV-1 Thermal Control Valve when the water supply is provided by a wet pipe sprinkler system. Waterflow alarms upon operation of the TCV-1 are provided via the wet pipe system. The TCV-1 may be supplied from a dry pipe system or a deluge system. In the case of a dry pipe system, operation of the TCV-1 releases air pressure (minimum 20 psi) to permit operation of a dry pipe valve. Opening of the dry pipe valve provides for waterflow and system waterflow alarms. In the case of a deluge system and upon operation of the deluge system, water is only permitted past the TCV-1 if it has operated, thereby controlling waterflow to specific areas.

The TCV-1 may be installed in any position; however, the Valve Actuating Unit must be in the area being protected. For example, the TCV-1 may be installed above a ceiling where its Valve Actuating Unit is exposed below the ceiling line. The Valve Actuating Unit to ceiling distance and the area of coverage is to be in accordance with the NFPA 13 rules for standard coverage sprinklers as a function of the protected hazard and ceiling construction. For deluge valve applications, the location of the Valve Actuating Unit and area of coverage is to be in accordance with the NFPA 15 rules for pilot sprinklers.

### NOTE

The TCV-1 utilizes the same thermal sensing element as used for standard response, standard coverage, solder type sprinklers.



## Resetting Procedure

Steps 1 through 6 are to be performed when resetting the Model TVC-1 Thermal Control Valve after system operation due to a fire.

**Step 1.** Close the Control Valve for the water supply.

**Step 2.** Unscrew the Cap Screws (3) and remove the Valve Actuating Unit (2, 4, 5, 6, 7, 11, 12, 13) from the Body Assembly (1, 9). Remove and discard the operated Valve Actuating Unit.

**Step 3.** Remove the Plug Valve Assembly (8,) from the Body Assembly. Inspect the Plug Valve Assembly (8) including O-Ring (10) to be sure that they are in good condition. Clean the interior of the Body (1), the Seat Ring (9) bore, and the Plug Valve Assembly.

**Step 4.** Inspect the Seat Ring (9) bore and O-Ring (10) for damage that might prevent proper sealing. Replace damaged parts.

**Step 5.** Apply FS3452 Fluorosilicone Grease (13) around the outside of the O-Ring (10), and then apply the remainder of the Grease around the inside of O-Ring (11).

**NOTE**

*The use of a lubricant other than FS3452 Fluorosilicone Grease will impair the proper operation of the TCV-1.*

**Step 6.** Replace the Plug Valve Assembly, and then mount the replacement Valve Actuating Unit taking care to evenly tighten the four Cap Screws.

**NOTE**

*Make certain that the temperature rating of the replacement Valve Actuating Unit is of the proper rating for the area being protected.*

**Step 7.** Open the Control Valve in the water supply.

The valve is now set for service.

## Operation

When the Model TCV-1 Thermal Control Valve is in its normal service condition, it is held closed by the Valve Actuating Unit. When the temperature of the solder rises above its melt point, the Fusible Assembly will separate allowing the Valve Lever to rotate. Water supply pressure then forces the Plug Valve Assembly to open, thus permitting water to flow through the TCV-1 Valve into the system.

## Installation

The Model TCV-1 Thermal Control Valve must be installed with a supply pressure gauge and 3/4 inch (DN20) drain valve as shown in Figure 2. Where the TCV-1 is supplied by a wet pipe sprinkler system, the TCV-1 Valve and adjacent water supply piping cannot be exposed to freezing temperatures.

**NOTE**

*The inlet and outlet connections must be made as shown, since the valve cannot operate properly if connected backwards.*

## Care and Maintenance

Inspection, testing, and maintenance must be performed as in accordance with the requirements of the NFPA, and any impairment must be immediately corrected.

**NOTE**

*The TVC-1 by the nature of its design cannot be annually trip tested per the requirements of NFPA 25. During the annual internal inspection; however, removal of the Plug Valve Assembly for inspection will facilitate movement of the internal parts. At this time and prior to reassembly, assure that the O-Rings (10 and 11) are properly lubricated with FS3452 Fluorosilicone Grease.*

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 any authorities having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions.

It is also recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

**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 systems must first be obtained from the proper authorities and all personnel who may be affected by this decision must be notified.*

## Limited Warranty

Products manufactured by Tyco Fire Products 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 Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products 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 Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products 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 TYCO FIRE PRODUCTS 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 TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' 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.**

## Ordering Procedure

**Thermal Control Valve**

Specify: (specify size and temperature rating) Model TVC-1 Thermal Control Valve, P/N (specify).

1 Inch —165°F/74°C.....	P/N 52-010-1-005
1 Inch — 212°F/100°C....	P/N 52-010-1-006
1-1/2 Inch —165°F/74°C ..	P/N 52-010-1-001
1-1/2 Inch — 212°F/100°C.	P/N 52-010-1-002

**Valve Actuating Unit**

Specify: (specify temperature rating) Valve Actuating Unit for Model TCV-1 / F430 / F431 Thermal Control Valve, P/N (specify).

165°F/74°C .....	P/N 52-011-1-001
212°F/100°C.....	P/N 52-011-1-002

**NOTE**

*An adequate supply of spare Valve Actuating Units must be maintained on hand, in order to minimize the time that the system is out of service following an operation.*

**Replacement Valve Parts:**

Specify: (description) for use with Model TVC-1 / F430 / F431 Thermal Control Valve, P/N (see Figure 1).