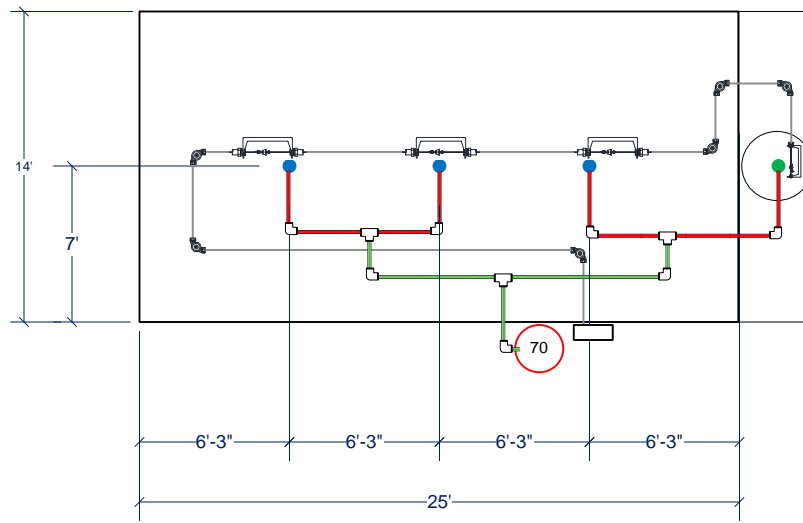




MONARCH™ INDUSTRIAL FIRE SUPPRESSION SYSTEM

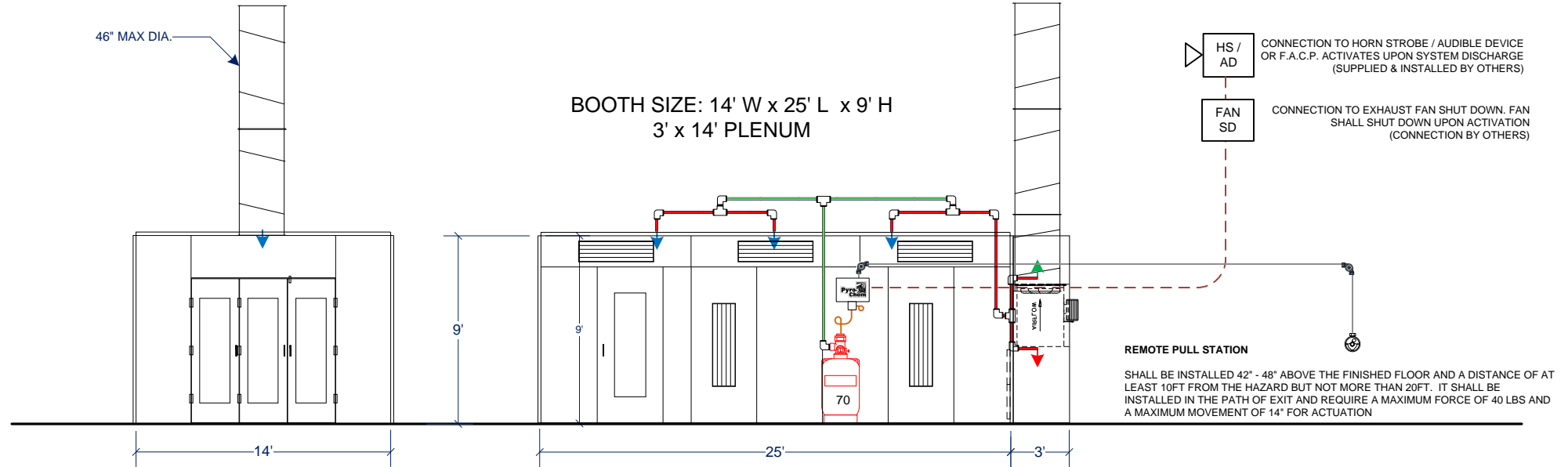
NV-WA NOZZLE COVERAGE
14' Width x 9' Height = 11.43 Ft
 $25 / 11.43 = 2.18$ or 3 Nozzles



PIPE SIZES	
—	3/4" Ø PIPE
—	1" Ø PIPE

FUSIBLE LINKS RATED
AT 165 DEG F

OVERHEAD NOZZLE LOCATIONS:
2 FT MAX OFF-CENTER LONGEST AND SHORTEST SIDE
0" - 6" OFF CEILING



BOOTH SIZE: 14' W x 25' L x 9' H
3' x 14' PLENUM

70 LB PYRO CHEM DRY
CHEMICAL SYSTEM

REMOTE PULL STATION
SHALL BE INSTALLED 42" - 48" ABOVE THE FINISHED FLOOR AND A DISTANCE OF AT
LEAST 10FT FROM THE HAZARD BUT NOT MORE THAN 20FT. IT SHALL BE
INSTALLED IN THE PATH OF EXIT AND REQUIRE A MAXIMUM FORCE OF 40 LBS AND
A MAXIMUM MOVEMENT OF 14" FOR ACTUATION

NOZZLE LEGEND

▼	DUCT NOZZLE - NV-DP2
▼	TOTAL FLOOD NOZZLE - NV-WA
▼	PLENUM NOZZLE - NV-P1

SEE PIPING LAYOUT AND LIMITATIONS
ON PAGES 2

PRE-ENGINEERED SYSTEM SHOP
DRAWING ONLY - NOT TO SCALE

EXAMPLE DRAWINGS PROVIDED BY: <http://www.firesystemdrawings.com>



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SOME RESTAURANT
123 MAIN STREET
BREMERTON, WA 98337

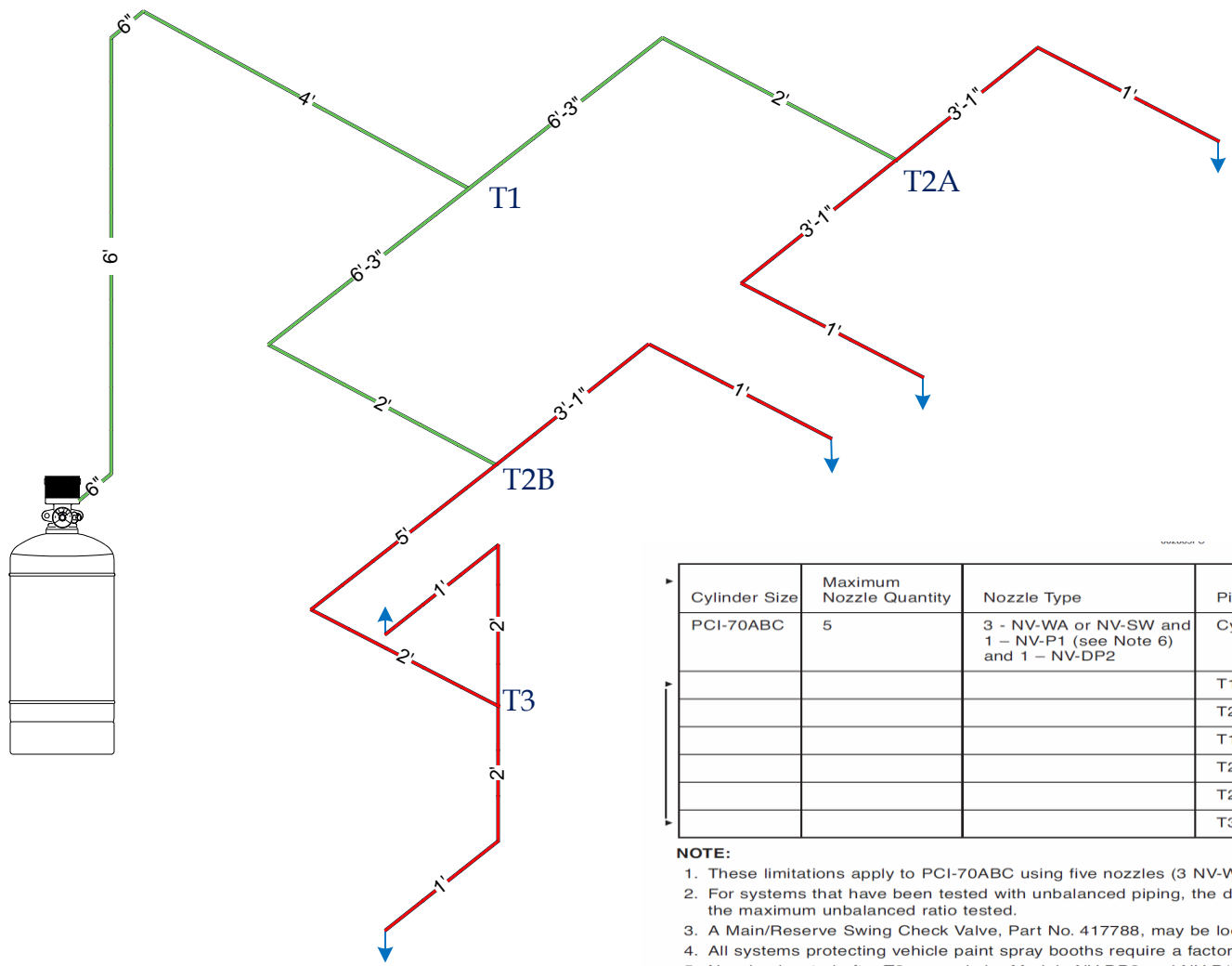
SIZE	FSCM NO	DWG	REV
		FIRE SYSTEM	
SCALE	N/A	SHEET	1 OF 6

BOOTH PIPE ISOMETRIC AND PIPE LIMITATIONS

PIPE SIZES

— 3/4" Ø PIPE

— 1" Ø PIPE




Cylinder Size	Maximum Nozzle Quantity	Nozzle Type	Piping Section	Size	Length Maximum	Elbows Maximum
PCI-70ABC	5	3 - NV-WA or NV-SW and 1 - NV-P1 (see Note 6) and 1 - NV-DP2	Cylinder to T1	1 in.	16 ft (4.9 m)	2
			T1 to T2A	1 in.	9 ft (2.7 m)	2
			T2A to Nozzle	3/4 in.	8 ft (2.4 m)	2
			T1 to T2B	1 in.	9 ft (2.7 m)	2
			T2B to Nozzle	3/4 in.	6 1/2 ft (2 m)	2
			T2B to T3	1 in.	6 ft (1.8 m)	2
			T3 to Nozzle	3/4 in.	4 ft (1.2 m)	2

NOTE:

- These limitations apply to PCI-70ABC using five nozzles (3 NV-WA or NV-SW, 1 NV-P1, and 1 NV-DP2).
- For systems that have been tested with unbalanced piping, the difference in the length of piping must not exceed 10% of the maximum unbalanced ratio tested.
- A Main/Reserve Swing Check Valve, Part No. 417788, may be located between the cylinder and T1.
- All systems protecting vehicle paint spray booths require a factory pre-set time delay.
- Nozzles located after T3 can only be Models NV-DP2 and NV-P1.
- When using NV-P1 nozzle, the two largest discharge orifices in the nozzle must be positioned parallel to the longest dimension of the hazard being protected.
- Maximum height of nozzle from base of tank to nozzle – 20 ft (6.1 m).

EXAMPLE DRAWINGS PROVIDED BY: <http://www.firesystemdrawings.com>

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	SOME RESTAURANT 123 MAIN STREET BREMERTON, WA 98337			
SIZE	FSCM NO	DWG	REV	
		FIRE SYSTEM		
SCALE	N/A	SHEET	2 OF 6	

TOTAL FLOODING (DETECTOR SPACING) – FUSIBLE LINKS

Ceiling Height	Spacing
Up to 12 ft (3.66 m) Height	12 ft (3.66 m) maximum detectors 6 ft (1.83 m) max. from a wall* 144 sq ft (13.38 sq m) max. coverage per detector
Greater than 12 ft (3.66 m) up to 16 ft (4.88 m) height	10 ft (3.05 m) max. between detectors 5 ft (1.52 m) max. from wall 100 sq ft (9.29 sq m) max. coverage per detector
Greater than 16 ft (4.88 m) up to 20 ft (6.1 m) height	8 ft (2.44 m) max. between detectors 4 ft (1.22 m) max. from wall 64 sq ft (5.95 sq m) max. coverage per detector

Note: For sloped ceiling (peaked type or shed type) installations, refer to NFPA-72, "National Fire Alarm Code" for detailed spacing requirements.

LOCAL APPLICATION – OVERHEAD (DETECTOR SPACING) – Maximum spacing per fusible link detector is 36 ft² (3.3 m²) or 3 ft (0.9 m) from edge of hazard and 6 ft (1.8 m) between fusible link detectors.

When a detector(s) is mounted more than 1 ft (0.3 m) below ceiling or in an open area, heat trap(s) is recommended. Detectors should be mounted overhead at nozzle height or as close to the hazard as possible without interference, not to exceed 10 ft (3 m).

Detectors should not be located where they will be susceptible to damage during the normal work operation.

LOCAL APPLICATION – TANKSIDE (DETECTOR SPACING) – Detectors can be located either near the inner tank wall and flammable liquid surface or above the tank. If located above the tank, the rules for local application overhead would apply. If located on the tank wall, the detectors can be mounted horizontally or vertically in the freeboard area but must be protected from damage during normal working operation. Detectors should be located at a maximum spacing per detector of 3 ft (0.9 m) from edge of hazard and 6 ft (1.8 m) between detectors on the long side of the tank.

*For 14 ft (4.3 m) wide booths with maximum height of 12 ft (3.7 m), the detector location off the side wall can be a maximum of 7 ft (2.1 m), and 10 ft (3 m) maximum distance between detectors.

Fusible Links.

The fusible link is designed to separate at a specific temperature, releasing tension from the fusible link line, causing system actuation. See Figure 2-12.

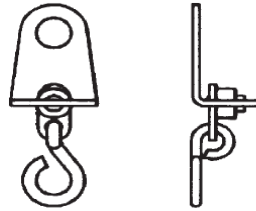


Figure 2-12. ML Style Fusible Link.
002851PC

After determining the maximum ambient temperature at the fusible link location, select the correct fusible link according to the temperature condition chart below:

Fusible Link Model No.	Maximum Ambient Temperature
FL-165	100° F (38° C.)
FL-212	150° F (66° C.)
FL-280	225° F (107° C.)
FL-360	290° F (143° C.)
FL-450	360° F (182° C.)
FL-500	400° F (204° C.)

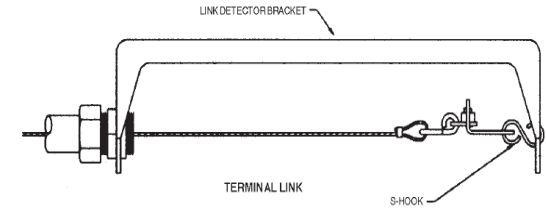


Figure 4-6. Terminal Link Installation.
002849PC

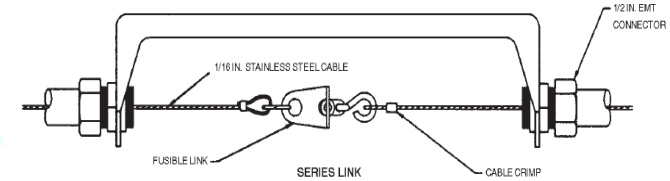



Figure 4-7. Series Link Installation.
002849PC

TOTAL FLOODING (DETECTOR SPACING) – FUSIBLE LINKS

Ceiling Height	Spacing
Up to 12 ft (3.66 m) Height	12 ft (3.66 m) maximum detectors 6 ft (1.83 m) max. from a wall* 144 sq ft (13.38 sq m) max. coverage per detector

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SIZE	FSCM NO	DWG	REV	
		FIRE SYSTEM		
SCALE	N/A	SHEET	3 OF 6	

PIPE AND NOZZLE INSTALLATION

General Piping Requirements

1. Use Schedule 40 black iron (if used in a relatively non-corrosive atmosphere), galvanized, chrome-plated, or stainless steel pipe conforming to ASTM A120, A53, or A106. Fittings must be a minimum of 150 lb. Class. However, the PCI 35, 50, and 70 lb. cylinders must have a minimum of two (2) nozzles per cylinder to utilize the 150 lb. Class fittings. If the PCI 35, 50, or 70 lb. cylinder has one (1) nozzle, then a 300 lb. Class fitting must be used. The remaining Monarch cylinders have no limitations for the 150 lb. Class fittings. Distribution pipe sizes are 3/4 in. or 1 in. depending on number of nozzles.
2. Pipe unions are acceptable.
3. Use reducing tees for all pipe splits.
4. Reducing bushings are not acceptable.
5. Cast iron pipe and fittings are not acceptable.
6. **Pipe thread sealant or pipe joint compound is not allowed for distribution piping.**
7. Bell Reducer or any non-restrictive fittings are allowed.
8. Before assembling the pipe and fittings, make certain all ends are carefully reamed and blown clear of chips and scale. Inside of pipe and fittings must be free of oil and dirt.
9. If Teflon tape is used on threaded ends, start at the second male thread and wrap the tape clockwise around the threads, away from the pipe opening.
10. All system piping must comply with Section A-5-9.1 of NFPA-17.

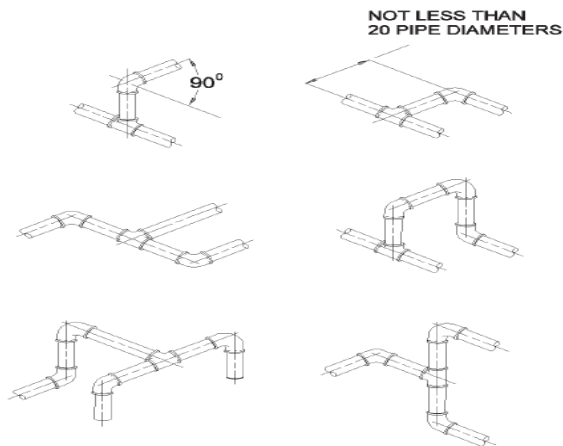


Figure 4-25. Acceptable Piping Methods.

002965PC

CAUTION

Do not apply Teflon tape to cover or overlap the pipe opening, as the pipe and nozzles could become blocked and prevent the proper flow of agent

TIME DELAY

The Model TD-10 Time Delay is required to be installed on all Pyro-Chem Vehicle Paint Spray Booth Fire Suppression Systems. The Model T-10 Time Delay is a factory pre-set mechanical time delay which retards the system discharge for a period of 10-20 seconds after actuation to allow for exhaust fan wind-down. The time delay is field mounted between the PYRO-CHEM control head (Models MCH3, NMCH3, ECH3-24, or ECH3-120) and the discharge valve assembly of the agent cylinder(s) and/or pneumatic actuating cylinder(s). See Figure 2-24.

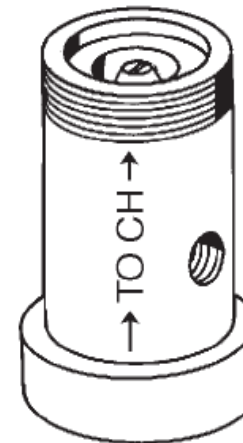


Figure 2-24. Time Delay

003150PC



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SIZE	FSCM NO	DWG	REV
		FIRE SYSTEM	
SCALE	N/A	SHEET	4 OF 6

Total Flooding

a. Cylinders:

The Models PCI-15ABC, PCI-17ABC, PCI-25sABC, PCI-35ABC, and PCI-70ABC cylinders can be used for total flooding vehicle paint spray booth applications.

b. Nozzles:

► Seven nozzles are available for use in protecting vehicle paint spray booths:

Nozzle	Application
NV-WA	Work Area/Plenum/Pit (Overhead Position)
NV-SW	Work Area/Plenum/Pit (Sidewall Position)
NV-P1	Backdraft/Pit (Overhead Position)
NV-UF	Under Floor (Overhead Position)
NV-DP2	Pit/Duct (End Position – Horizontal)
N-DCT	Duct Only*
► N-PLU	Three-Way Nozzle (Pits, Plenums, Under Floor Trenches)

* Can be used with PCI-15ABC and PCI-25sABC cylinders only

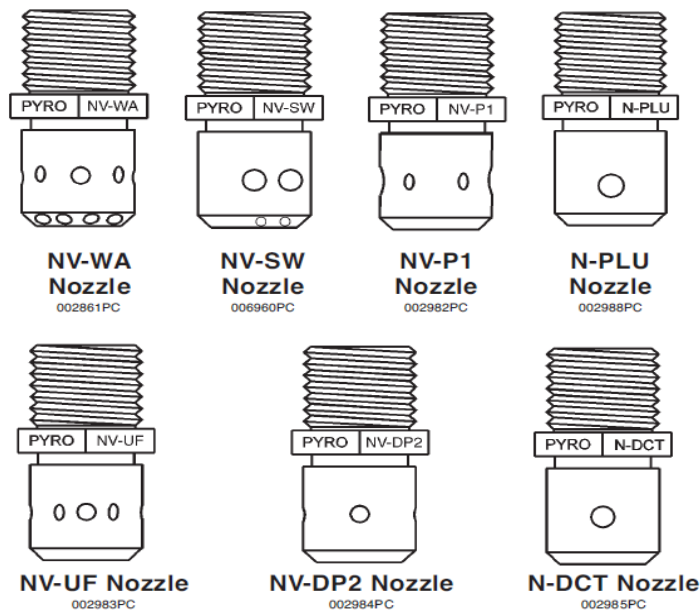



Figure 2-3 Nozzles

EXAMPLE DRAWINGS PROVIDED BY: <http://www.firesystemdrawings.com>

NOZZLE SELECTION

Protection	Nozzle	Protection Zone/Nozzle			Specifications Maximum	Nozzle Location within Protection Zone	Nozzle Offset ³	Nozzle Orientation
		L	W	Ht				
Work Area ¹	NV-WA	See Table 3-1			Volume 1920 cu ft Area 160 sq ft Diagonal 18.86 ft	2 ft maximum off center (each side)	0 to 6 in.	Vertical pointing down
Pant Leg Plenum ²	NV-P1	4 ft	16 ft	20 ft	Volume 1280 cu ft Area 64 sq ft Side 16 ft	Shortest side-center Longest side-3 inch off center (each side)	0 to 6 in.	Vertical
Exhaust Duct	NV-DP2	3 ft	3 ft	24 ft	Volume 216 cu ft Area 9 sq ft Side 3 ft	Shortest side (cross section) – center Longest side (cross section)	0 to 6 in.	Horizontal for horizontal ducts Vertical for vertical ducts

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SIZE	FSCM NO	DWG	REV	
		FIRE SYSTEM		
SCALE	N/A	SHEET	5 OF 6	

ELECTRICAL SWITCHES

The electrical switches are intended for use with electric gas valves, alarms, contactors, lights, contractor supplied electric power shut-off devices and other electrical devices that are designed to shut off or turn on when the system is actuated.

Switches are available in kits: One Switch Kit, Part No. 551154; Two Switch Kit, Part No. 551155; Three Switch Kit, Part No. 551156, and Four Switch Kit, Part No. 551157. Mounting hardware and 12 in. wire assemblies are provided with each kit. Each switch has a set of single-pole, double-throw contacts rated:

UL/cUL/CSA Rating

250 VAC, 21A Resistive
250 VAC, 2 HP
125 VAC, 1 HP

ENEC Rating

IE4T105 μ Approved
250V, 21A Resistive
8A Motor Load

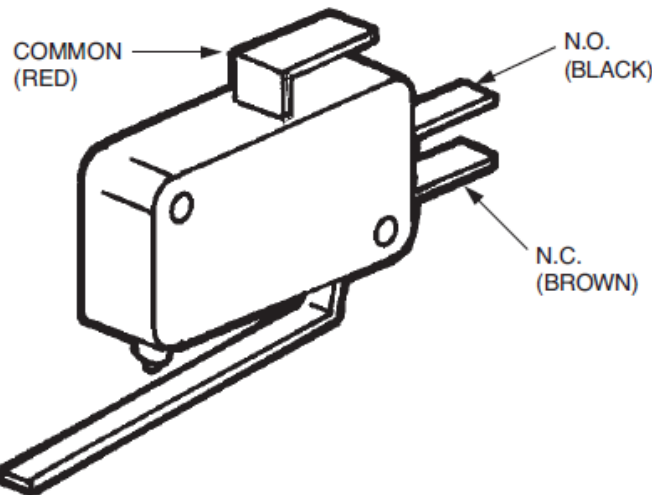


Figure 2-20a. Model MS-SPDT Micro Switch.

001612

MODEL RPS-M – REMOTE MECHANICAL PULL STATION

Remote manual control for system releasing devices is provided by the Model RPS-M remote mechanical pull station. It is connected to the system releasing device by stainless steel cable. This cable is enclosed in 1/2 in. EMT conduit with corner pulleys at each change in direction. The remote mechanical pull station shall be located at the point of egress from the hazard area. See Figure 2-13.

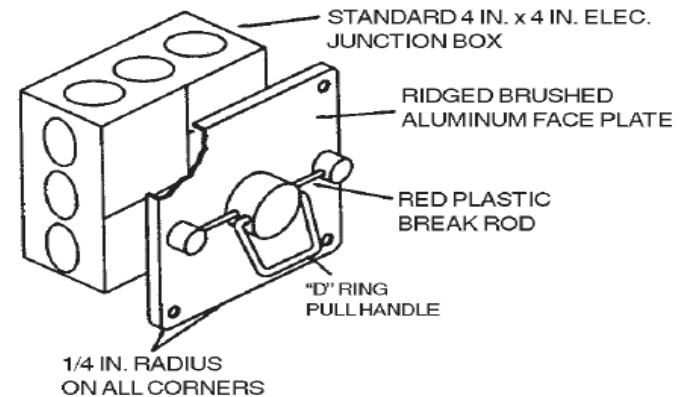
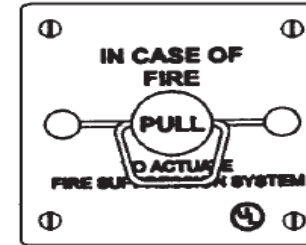


Figure 2-13. Model RPS-M Mechanical Pull Station.

002852PC



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SIZE	FSCM NO	DWG	REV
		FIRE SYSTEM	
SCALE	N/A	SHEET	6 OF 6