DESIGN, INSTALLATION, OPERATION AND MAINTENANCE MANUAL

FOR

FIRETRACE TIME DELAY, 24V, WITH NITROGEN RESERVOIR

MODELS: 600440 and 600445

P/N 800071

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TIME DELAY, 24V, WITH NITROGEN RESERVOIR

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1.0 FORWARD

1.1 General

This manual is written for the fire protection professional that designs, installs, and maintains Firetrace Fire Suppression Systems and Accessories.

Firetrace Time Delay 24V with Nitrogen Reservoir units (Time Delay) are to be installed, inspected, tested, maintained, and recharged by qualified trained personnel in accordance with the following:

- All instructions, limitations, etc. contained in this manual P/N 800071
- Local Authority having jurisdiction.

Firetrace Time Delay units are accessory units to Firetrace Suppression units. Refer to the connected Firetrace Suppression unit's manual for more information on spaces that these systems can protect, types of fires these systems can be used on, and when these units should not be used.

Local authorities having jurisdiction should be consulted to verify that the Firetrace Time Delay unit meets all standards relevant to a particular application. This device is only to be utilized when accepted by the authority having jurisdiction. All other uses of this switch should be approved by the authority having jurisdiction.

1.2 Safety Precautions

Safety precautions are essential when any electrical or mechanical equipment is involved. These precautions should be followed when handling, servicing, and recharging Firetrace Time Delay units and Firetrace Suppression units. If safety precautions are overlooked or ignored, personal injury or property damage may occur.

The following symbols are used throughout this manual. Always heed these precautions. They are essential to the safe use of the equipment described in this manual.

⚠ DANGER:

This danger symbol identifies immediate hazards and provides specific instructions or procedures, which if not correctly followed WILL result in severe personal injury or death.

⚠ WARNING:

This warning symbol identifies specific instructions or procedures, which, if not correctly followed, COULD result in severe personal injury of death.

⚠ CAUTION:

This caution symbol identifies specific instructions or procedures, which, if not correctly followed, COULD result in minor personal injury or equipment or property damage.

The following safety precautions should always be followed:

1. Read and understand this manual and the other documents referenced herein.
2. Read and understand the manual for the attached Firetrace Suppression unit.
3. Wear safety glasses when working with pressurized cylinders and charging equipment.
4. Before removing the cylinder from the installation and before performing any charging, leak tests, or salvage operations, disconnect electrical connection so the attached Firetrace Suppression unit does not discharge.
5. To depressurize the Nitrogen Reservoir, depressurize through the End of Line Adapter, before removing the tubing or cylinder from the installation and before performing any charging, leak tests, or salvage operations.
6. Make sure that on the attached Firetrace Suppression unit, the ball valve (attached to the top of the cylinder valve) is closed (lever is in "OFF" position), the detection tubing has been removed from the cylinder valve, and the safety caps installed before removing the cylinder from the installation and before performing any charging, leak tests, or salvage operations.
7. Follow all the safety procedures included in this manual and manual for the attached Firetrace Suppression unit(s).
8. Never assume that a cylinder is empty. Treat all cylinders as if they are fully charged.

Any questions concerning the information contained in this manual should be addressed to:

Firetrace USA LLC.
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The following web site should be visited for frequent technical announcements

www.firetrace.com

2.0 SYSTEM DESCRIPTION

2.1 General

The Time Delay is designed to delay the discharge of Firetrace Suppression unit(s). Each unit when actuated, delays the releasing of the suppression agent by either 10 ± 0.5 (PN 600440) or 30 ± 1.5 (PN 600445) seconds, from the connected Firetrace Suppression unit(s), into the hazard area. The Firetrace Time Delay unit acts as the detection system and is connected to the Firetrace Suppression unit(s) which acts as the discharge system.

The Time Delay has the following part numbers and descriptions:

600440 - TIME DELAY, 10 SEC, 24V, WITH NITROGEN RESERVOIR
600445 - TIME DELAY, 30 SEC, 24V, WITH NITROGEN RESERVOIR

The Time Delay consists of the following major components:

- Time Delay 24V Module
- Nitrogen Reservoir Cylinder
- Firetrace Detection Tubing (ordered separately)
- End of Line Adapter
- Mounting Bracket
- Pressure Gauge
- Low Temperature Slip-on Fittings

The Time Delay unit utilizes two lines of Firetrace tubing: Detection Tubing Line 1 and Actuation Tubing Line 2. Detection Tubing Line 1 act as the heat detection. Firetrace tubing is designed to burst at any point along its length upon direct flame impingement or where the radiant heat from the flame reaches approximately 383°F (195°C). The tubing is inserted into slip-on fittings and connects the Detection Tubing Line 1 port of the Time Delay 24V Module, the Nitrogen Reservoir, End-of-Line adapter, and Manual Release (if applicable). The tubing is installed throughout the hazard enclosure and pressurized with dry nitrogen to 195 – 210 psig (13.4 – 14.5 bar) through the End-of-Line adapter or Manual Release. Actuation Tubing Line 2 connects the Actuation Tubing Line 2 port of the Time Delay 24V Module to the Firetrace Suppression unit(s) and is pressurized with dry nitrogen to 195 – 210 psig (13.4 – 14.5 bar) through the End-of-Line adapter.

Once Detection Tubing Line 1 is ruptured, the activation pressure switch actuates the time delay relay. After the time delay (10 or 30 seconds), the solenoid is actuated and releases the pressure in Actuation Tubing Line 2 which is connected to the Firetrace Suppression unit(s). The connected Firetrace Suppression unit(s) will then distribute suppression agent through the discharge port's nozzle(s) into the protected area. Upon rupture of Detection Tubing 1, the service pressure switch can be used to indicate discharge, shutdown ventilation, close all openings, shut-off electrical power, etc. as may be required. The Time Delay unit can be reset for multiple uses.

Refer to Table 1: Time Delay, 24V, with Nitrogen Reservoir, Table 2: Time Delay, 10 SEC, 24V, with Nitrogen Reservoir (PN 600440) Bill of Materials, and Table 3: Time Delay, 30 SEC, 24V, with Nitrogen Reservoir for the Time Delay's properties and bill of materials.

Table 1: Time Delay, 24V, with Nitrogen Reservoir (PN 600440 and PN 600445) Properties

Electrical Rating	24 VDC
Time Delay	10 ± 0.5 seconds (PN 600441) 30 ± 1.5 seconds (PN 600446)
Operating Temperature	-40°F to +158°F [-40°C to +70°C]
Pressure	During installation, pressurize to 195 – 210 psig (13.4 – 14.5 bar) at 70°F
Vibration	IEC 60068-2-64 – Test Fh ISO 16750-3:2007 – Section 4.1.2.7- Test VII
Shock	IEC 60068-2-29 ISO 16750-3:2007 – Section 4.2.2
Service Pressure Switch	Single Pole, Double Throw (SPDT) Normally Open (NO) or Normally Closed (NC) NC at atmospheric pressure Falling Setpoint: 120 ± 5 psig (8.3 ± 0.35 bar) at 70°F (21°C) 5A [12-24 VDC, 125 VAC]
Activation Pressure Switch	Single Pole, Single Throw (SPST) Normally Closed (NC) at atmospheric pressure Falling Setpoint: 70 ± 10 psig (4.8 ± 0.7 bar) at 70°F (21°C) 42 VDC, 100 VA
Time Delay Relay	24 VDC
Solenoid	24 VDC
Cable	5 conduits, 16 AWG

Table 2: Time Delay, 10 SEC, 24V, with Nitrogen Reservoir (PN 600440) Bill of Materials

ITEM	P/N	DESCRIPTION	QTY
1	120305	ACCESSORY BRACKET	1
2	200195	EOL ADAPTER	1
3	201157	FITTING, TUBE TEE, 4/6 MM, LOW TEMPERATURE	1
4	201179	FITTING, TUBE TO THREADS UNION, 4/6 MM, LOW TEMPERATURE	1
5	306128	O-RING, PORT ADAPTER, M10X1	1
6	400029	GAUGE, GENERIC M10X1, 195PSI	1
7	600441	MODULE, TIME DELAY, 10 SEC, 24V	1
8	600447	ASSEMBLY, NITROGEN RESERVOIR	1

Table 3: Time Delay, 30 SEC, 24V, with Nitrogen Reservoir (PN 600445) Bill of Materials

ITEM	P/N	DESCRIPTION	QTY
1	120305	ACCESSORY BRACKET	1
2	200195	EOL ADAPTER	1
3	201157	FITTING, TUBE TEE, 4/6 MM, LOW TEMPERATURE	1

4	201179	FITTING, TUBE TO THREADS UNION, 4/6 MM, LOW TEMPERATURE	1
5	306128	O-RING, PORT ADAPTER, M10X1	1
6	400029	GAUGE, GENERIC M10X1, 195PSI	1
7	600446	MODULE, TIME DELAY, 30 SEC, 24V	1
8	600447	ASSEMBLY, NITROGEN RESERVOIR	1

2.2 Operating Pressure and Temperature Range

When installed, the Nitrogen Reservoir Cylinder should be pressurized to 195 – 210 psig (13.4 – 14.5 bar) at 70°F using the detection tube charge kit (PN 600213).

The Time Delay has a storage and operating range of -40°F to +158°F (-40°C to +70°C). Table 4: System Pressure-Temperature Relationship shows the Time Delay nitrogen reservoir at a charged pressure of 195 psig (13.4 bar) at 70°F (21.1°C) and the cylinder pressure-temperature relationship.

Table 4: System Pressure-Temperature Relationship

Temperature (°F)	Temperature (°C)	Pressure (psig)	Pressure (bar)
-40	-40.0	151	10.4
-30	-34.4	155	10.7
-20	-28.9	159	11.0
-10	-23.3	163	11.3
0	-17.8	167	11.5
10	-12.2	171	11.8
20	-6.7	175	12.1
30	-1.1	179	12.3
40	4.4	183	12.6
50	10.0	187	12.9
60	15.6	191	13.2
70	21.1	195	13.4
80	26.7	199	13.7
90	32.2	203	14.0
100	37.8	207	14.3
110	43.3	211	14.5
120	48.9	215	14.8
130	54.4	219	15.1
140	60.0	223	15.4
150	65.6	227	15.6
158	70.0	230	15.8

2.3 Time Delay 24V Module and Wiring Diagram- PN 600441 and PN 600446

The Time Delay 24V Module (PN 600441 and PN 600446) contains a service pressure switch, an activation pressure switch, a time delay relay, and a solenoid. There are two ports with slip-on tube fittings from the module. The Detection Tubing Line 1 port

contains a manifold with activation and service pressure switches and is connected to Detection Tubing Line 1 routed through the hazard area. The Actuation Tubing Line 2 port contains a solenoid used to release the pressure in the actuation circuit (Actuation Tubing Line 2) connected to the Firetrace Suppression unit(s).

For dimensions and tubing placement of the Time Delay 24V Module, refer to Figure 1: Time Delay 24V Module (PN 600441 and PN 600446) Dimensions and Tubing Placement. For wiring information, refer to Figure 2: Time Delay 24V Module (PN 600441 and PN 600446) Wiring Diagram.

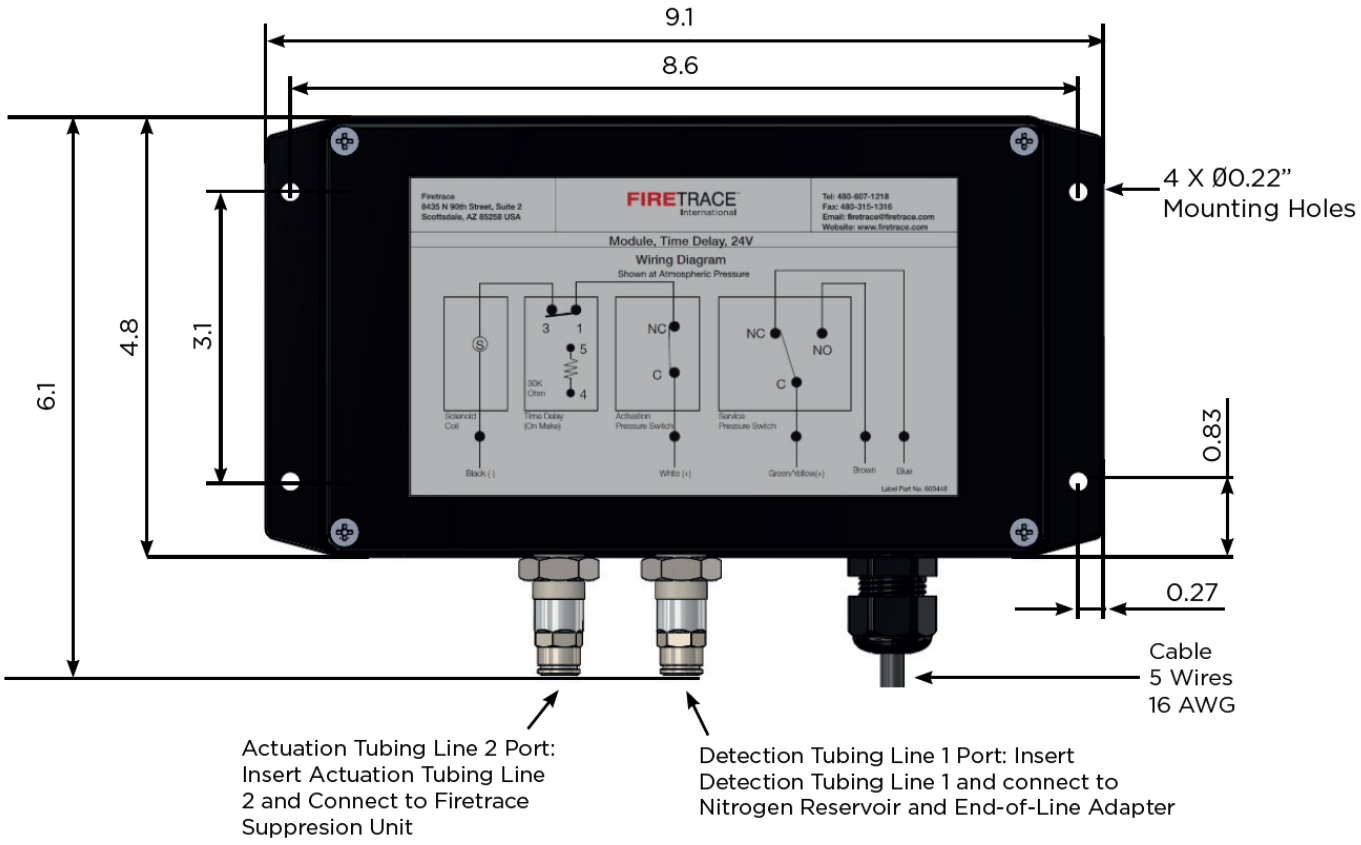

Figure 1: Time Delay 24V Module (PN 600441 and PN 600446) Dimensions and Tubing Placement

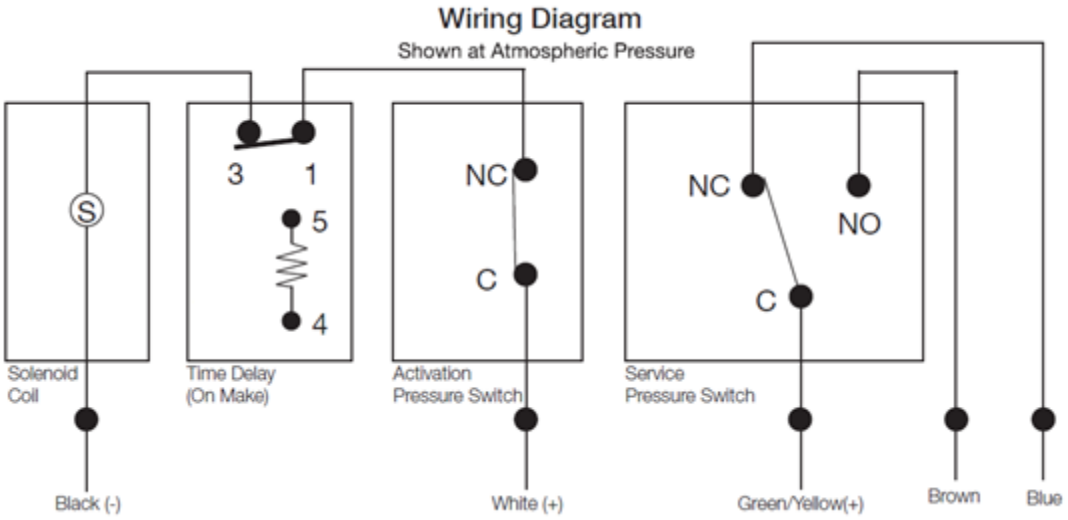

Figure 2: Time Delay 24V Module (PN 600441 and PN 600446) Wiring Diagram

The wiring diagram in Figure 2: Time Delay 24V Module (PN 600441 and PN 600446) Wiring Diagram is shown at atmospheric pressure. The wire colors correspond to the Time Delay 24V Module's 5 wire, 16AWG cable.

The service pressure switch monitors the pressure in the Detection Tubing Line 1 and the Nitrogen Reservoir and it can be used to energize or de-energize electrically operated equipment resulting in the shutdown of ventilation fans, closing of openings, shut-off of electrical power, etc. as may be required. The service pressure switch is single pole, double throw (SPDT) and can either be wired Normally Closed (NC) using the blue wire or Normally Open (NO) using the brown wire. The Green/Yellow wire is the common for the service pressure switch. At atmospheric pressure, the service pressure switch is normally closed. When Detection Tubing Line 1 is pressurized above 120 ± 5 psig (8.3 ± 0.35 bar), the contacts switch to normally open. When the pressure switch is used on a standard supervisory input circuit, there will be no distinction between a wiring fault and device actuation.

Use the white (+) and black (-) wires for the activation pressure switch, time delay relay, and solenoid. The activation pressure switch is single pole, single throw (SPST) and normally closed at atmospheric pressure. It monitors the pressure in Detection Tubing Line 1 and the Nitrogen Reservoir and it is used to activate the delay (10 or 30 seconds) of discharge from the connected Fire Suppression unit(s). When Detection Tubing Line 1 is pressurized, the activation pressure switch contacts will be open. When the pressure drops below 70 ± 10 psig (4.8 ± 0.7 bar), the activation pressure switch contact will be closed, and it will actuate the time delay relay. The time delay relay is steady state and delay-on-make and contains a resistor. The Time Delay 10 SEC 24V Module (PN 600441), contains a 10K Ohm resistor. The Time Delay 30 SEC 24V Module (PN 600446) contains a 30K Ohm resistor. Once actuated, the time delay relay will provide the delay (10 or 30 seconds) before actuating the solenoid, which will release the pressure in Actuation Tubing Line 2, causing the connected Firetrace Suppression unit(s) to discharge agent through the discharge piping and nozzles.

NOTE: All detection devices and auxiliary alarm and control devices must be electrically compatible with each other and approved by the authority having jurisdiction. The Time Delay shall be installed onto a circuit suitable for unit supervision in accordance with NFPA 70 National Electric Code and NFPA 72 National Fire Alarm and Signaling Code.

2.4 Nitrogen Reservoir- PN 600447

The Nitrogen Reservoir Assembly contains a cylinder with an adapter, low temperature slip-on tube fitting, and a cylinder clamp. During installation, the detection tube charge kit will be used to pressurize the cylinder with Nitrogen to 195 – 210 psig (13.4 – 14.5 bar) @ 70°F (21.1°C). The Nitrogen Reservoir provides an extra safety factor by providing more nitrogen volume in case of a small leak. Refer to Table 5: Cylinder Specification for the cylinder's specifications. Refer to Figure 3: Nitrogen Reservoir (PN 600447) Dimensions and Tubing Placement for the Nitrogen Reservoir's dimensions, components, and tubing placement information.

Table 5: Cylinder Specification

Nominal Capacity	Volume		Cylinder Specification	Cylinder Service Pressure		Cylinder Test Pressure		Overall Height		Outside Diameter	
	in³	L		psig	kPa	psig	kPa	in	cm	in	cm
1.37lb	38	0.63	DOT-39	240	1,655	300	2,068	7.63	19.38	2.9	7.4

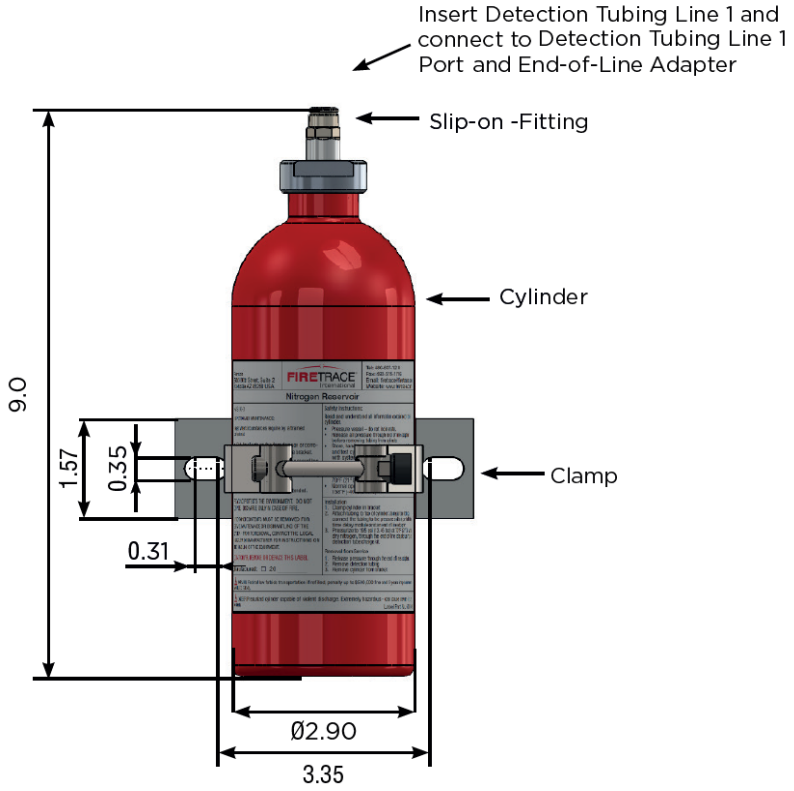

Figure 3: Nitrogen Reservoir (PN 600447) Dimensions and Tubing Placement

⚠ WARNING:

WARNING: Federal law forbids transportation of cylinder, P/N 100210, if refilled, penalty up to $500,000 fine and 5 years imprisonment (49 U.S.C. 5124).

3.0 INSTALLATION INSTRUCTIONS

This section provides installation instructions covering components and limitations described in 2.0 SYSTEM DESCRIPTION of this manual.

All components should be installed to facilitate proper inspection, testing, recharging, and any other required service or maintenance as may be necessary. Equipment must not be subjected to severe weather conditions or mechanical, chemical, or other damage, which could render the equipment inoperative. The equipment must be installed in accordance with instructions in this manual.

⚠ WARNING

The Time Delay unit must be handled, installed, and serviced in accordance with the instruction contained in this manual, the wiring diagram, the cylinder nameplate, and any other regulations and codes that may apply.

⚠ WARNING

Pressurized (charged) cylinders are extremely hazardous and if not handled properly are capable of causing bodily injury, death or property damage.

3.1 Time Delay and Nitrogen Reservoir Installation

The Time Delay unit should be located as close as possible to the protected enclosure. In some cases, the assembly can be mounted inside the protected enclosure. The assemblies shall be located in a readily accessible location to allow for ease of inspection service and maintenance. Mount the pressure gauge so it is facing out and away from the mounting wall to facilitate visual inspection. Mount the Time Delay and Nitrogen Reservoir cylinder where it will not be subject to accidental damage or movement. Suitable protection must be installed where necessary to prevent damage or movement.

1. Securely mount the Time Delay to structural support using the four mounting holes.
2. Securely mount the cylinder bracket to structural support using both mounting holes and securely place the cylinder in the bracket.
3. Place the end of line adapter in the accessory mounting bracket and tighten with the end of line adapter nut. Position the end of line so that the pressure gauge is facing out and securely mount the accessory bracket to structural support.

3.2 Detection Tubing, Fittings, and Accessories

3.2.1 Firetrace Detection Tubing

Location and spacing of Detection Tubing 1 throughout the hazard areas being protected is critical to the response time in the event of a fire. Refer to the connected Firetrace Suppression unit's manual for more information.

Use a slip-on tee fitting to connect Detection Tubing Line 1 to the slip-on fittings of the Time Delay 24V Module's Detection Tubing Line 1 port, Nitrogen Reservoir Cylinder, and an End of Line Adapter. A section of Detection Tubing Line 1 is to be installed throughout the hazard enclosure and pressurized with nitrogen to 195 – 210 psig (13.4 – 14.5 bar) through the End-of-Line adapter or optional Manual Release.

Use a slip-on tee fitting to connect Actuation Tubing Line 2 to the slip-on fittings of the Time Delay 24V Module's Actuation Tubing Line 2 port, the connected Firetrace Suppression unit(s), and an End of Line Adapter. Pressurize Actuation Tubing Line 2 with dry nitrogen to 195 – 210 psig (13.4 – 14.5 bar) through the End-of-Line adapter while maintaining the ball valve on the connected Firetrace Suppression unit in the "OFF" position. Actuation Tubing Line 2 CANNOT be used as a detection line and will not provide a time delay before the connected Firetrace Suppression unit(s) discharges suppression agent. Route Actuation Tubing Line 2 away from potential sources of heat or fire. If this is not possible, cover Actuation Tubing Line 2 with heat resistant sheathing.

Refer to section 3.2.2 Slip-On Fittings for instructions on how to insert tubing into slip-on fittings. Refer to Figure 4: Time Delay Connection to a Firetrace Suppression Unit which indicates placement of Detection Tubing Line 1 and Actuation Tubing Line 2 and how the Time Delay Unit connects to a Firetrace Suppression Unit.

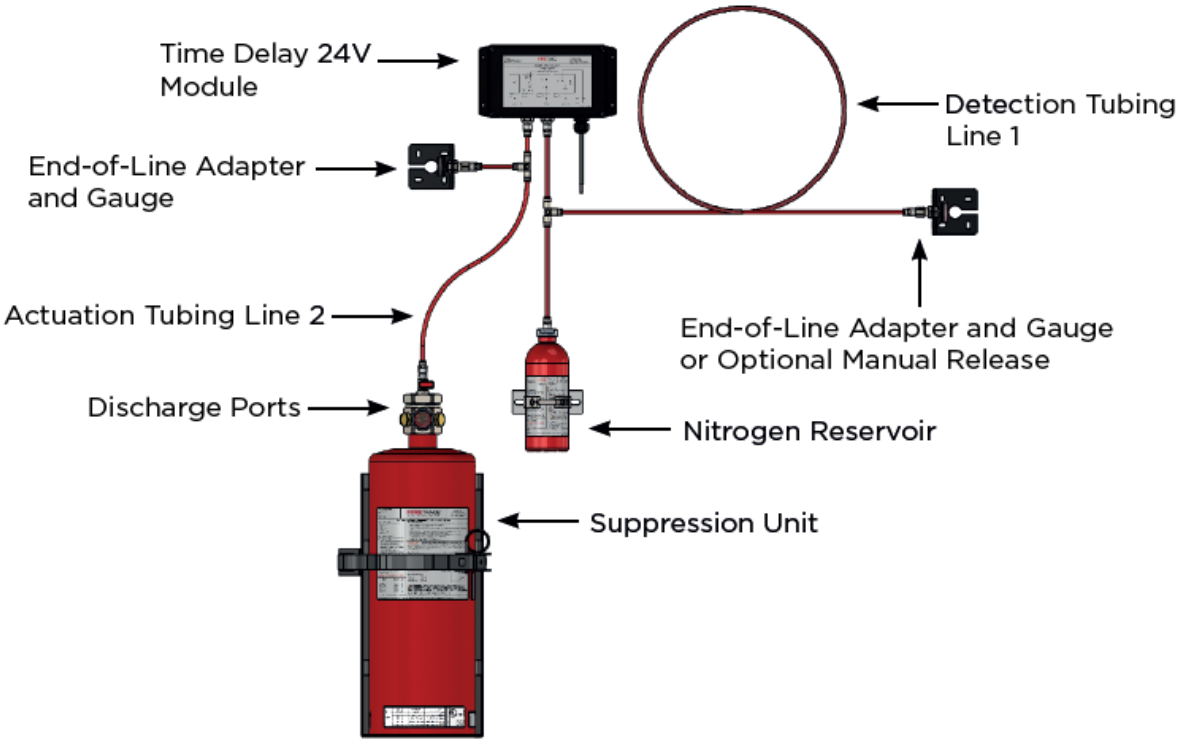

Figure 4: Time Delay Connection to a Firetrace Suppression Unit

⚠ CAUTION

Actuation Tubing Line 2 CANNOT be used as a detection line. If it is, there will be no time delay before the Firetrace Suppression unit(s) discharge agent. Route Actuation Tubing Line 2 away from potential sources of heat or fire or cover with heat resistant sheathing.

⚠ CAUTION

1. Do not kink, bend, or crush Firetrace tubing in order to prevent leakage, which could result in accidental unit discharge.
2. Do not install tubing in a hazardous environment where the maximum ambient temperature exceeds 176°F (80°C)
3. Do not place the tubing on a surface where the temperature of the surface exceeds 140°F (60°C)

3.2.2 Slip-On Fittings

All high-pressure slip-on fittings must be installed in the following manner:

1. Cut the tube end, ensuring the cut is square, clean, and free from burrs. Check that no debris is left in the tube.
2. Thoroughly clean the tubing to a distance of at least 2 in (5.08 cm) above the cut end, removing all dirt, grease, or grime. This will ensure a good seal inside the fitting.
3. Slide the tubing into the opening until it butts up against the inner wall, you should feel two distinct clicks when inserting the tubing. Pull lightly on the tubing and the brass outer ring should move outward slightly.

Additionally, the following rules must apply when installing the Detection Tube and fittings:

1. Detection Tube must be secured at
    a. Every change in direction
    b. Within 6” of any fitting
2. Every fitting must be secured to reduce vibration.
3. The Detection Tube is to be routed so that it is co-axial with the tube fittings as to reduce the side loading on the O-ring

If these recommendations are not followed the performance of the fittings cannot be guaranteed when subjected to high vibration or extreme temperatures. Low-temperature fittings are included in the assembly of the Time Delay and are recommended for the connected Firetrace Suppression unit(s).

3.2.3 End-of-Line Adapter and Pressure Gauge

The End-of-Line Adapter included with the Time Delay connects to Detection Tubing Line 1 through a slip-on fitting. To provide a lasting seal and to visually inspect the pressure in Detection Tubing Line 1, pressure gauge (P/N 400029) with an EPDM O-ring (P/N 306128) must be installed. Thread the pressure gauge into the End-of-Line Adapter so the gauge indicates the tubing pressure.

To insert the tubing on the End-of-Line Adapter's slip-on fitting, follow the procedures in section 3.2.2 Slip-On Fittings. An End-of-Line Adapter will also be needed on Actuation Tubing Line 2 that is connected to the Firetrace Suppression unit(s). It is recommended that pressure gauge (P/N 400029) with an EPDM O-ring (P/N 306128) are used for the connected Firetrace Suppression unit(s).

3.3 System Activation

1. Refer to the connected Firetrace Suppression unit(s)'s manual for installation of the Firetrace Suppression unit's cylinder and discharge network. Install the Time Delay as the detection network according to below.

2. Install the tubing (Detection Tubing Line 1 and Actuation Tubing Line 2), fittings, and accessories according the procedures specified in section 3.2 Detection Tubing, Fittings, and Accessories.

3. Detection Tubing Line 1 connects the Nitrogen Reservoir, the Detection Tubing Line 1 port of Time Delay 24V Module, and the End-Of-Line Adapter. Route Detection Tubing Line 1 throughout the enclose according to the procedures in section 3.2 Detection Tubing, Fittings, and Accessories.

4. With the connected Firetrace Suppression unit's ball valve still closed, connect Actuation Tubing Line 2 to the system from the Actuation Tubing Line 2 port of the Time Delay using the procedure in section 3.2 Detection Tubing, Fittings, and Accessories.

5. Attach the filling adapter (Firetrace P/N 910600 or 600010) to the End of Line Adapters. Refer to section 3.2 Detection Tubing, Fittings, and Accessories.

6. A regulator and calibrated pressure gauge shall be used to pressurize Detection Tubing Line 1 and Actuation Tubing Line 2 with dry nitrogen through the filling adapter (195 – 210 psig (13.4 – 14.5 bar)) at 70°F (21°C). It is recommended to have a portable dry nitrogen cylinder or Firetrace Nitrogen Fill Kit (Firetrace P/N 600213) for on-site use.

7. Remove the filling adapter and thread the pressure gauge (Firetrace P/N 400029) & O-ring (Firetrace P/N 306128) into its place to verify that the tubing is pressurized to the correct pressure at 70°F (21°C).

8. With the gauge still attached to the End of Line adapter, test for leakage:
   - Apply soapy water solution to all tubing/fitting connections Observe for bubble leaks.
   - Wait 30 minutes, then observe the pressure gauge. Any decrease in pressure is an indication of a leak.
   - In the event of a leak go back to section 3.2 Detection Tubing, Fittings, and Accessories and check the installation of all fittings and accessories.

9. Connect the electric wires from the Time Delay to the equipment according to section 2.3 Time Delay 24V Module and Wiring Diagram and the equipment manufacturers recommendations. Ensure that the proper electrical connections are made to annunciate unit discharge, shut down ventilation, etc., as may be required by the end user or the AHJ. (All electrical connections are to be in accordance to NFPA 70 National Electric Code).

10. After confirming that there is no leakage within the detector tubing and that the proper electrical connections have been made, **SLOWLY** rotate the ball valve lever on the attached Firetrace Suppression unit(s) counter clock wise to the "ON" position.

⚠ CAUTION
If the ball valves are opened abruptly, activation of the cylinder valve may occur, causing the unit to discharge.

11. Unit is now fully armed and ready for use.

4.0 SERVICE, MAINTENANCE, DISSASSEMBLY, AND POST DISCHARGE INSTRUCTIONS

⚠ WARNING
Firetrace Time Delay unit must be handled, installed, inspected and serviced only by qualified and trained personnel in accordance with the instructions contained in this manual, the wiring diagram, the cylinder nameplate, and any other regulations and codes that may apply.

ATTENTION
Any maintenance requiring depressurization, filling, or pressurization should only be performed at an Authorized Firetrace Service Location. Please contact Firetrace directly for a list of Authorized Firetrace Service Locations.

⚠ WARNING
Pressurized (charged) cylinders are extremely hazardous and if not handled properly are capable of causing bodily injury, death or property damage.

4.1 General

A regular program of systematic maintenance must be established for continuous, proper operation of all Time Delay units, and to avoid violating the warranty. A periodic maintenance schedule must be followed, and an inspection log maintained for ready reference. As a minimum, the log must record: (1) inspection interval, (2) inspection procedure performed, (3) maintenance performed, if any, as a result of inspection, and (4) name of inspector performing task.

For any deficiencies that are found, appropriate corrective actions shall be taken immediately. Inspections should be taken on a weekly, monthly, semi-annual basis according to the connected Firetrace Suppression unit's manual.

1. Make a general visual inspection of the unit(s) for damaged or missing parts.

2. Ensure access to hazard areas and cylinders are unobstructed and that there are not obstructions to the operation of the equipment.
3. Inspect detection tubing in hazard area for abrasion, distortion, cuts, or dirt accumulation, and that there are no obstructions preventing tubing from sensing a fire should one occur.
4. The Pressure Gauge(s) are in the operable range.
5. Neither the Protected Equipment nor the Hazard has been replaced, modified, or relocated.
6. Ensure that the proper electrical connections are not damaged, missing, or modified.

4.2 Depressurizing the Tubing

1. Turn ALL ball valve levers on the connected Firetrace Suppression unit(s) to the "off" position (perpendicular to the valve).
2. Remove the power supply from unit.
3. Depressurize Detection Tubing Line 1 and Actuation Tubing Line 2 by depressing the Schrader valves inside of the End-of-Line Adapters.
4. Remove the detection/actuation tubing from the slip-on fittings.

4.3 System Recharge

1. For recharging the connected Firetrace Suppression unit(s) please refer to that unit's manual.
2. For re-assembling and re-pressurizing the Time Delay, please see section 3.0 INSTALLATION INSTRUCTIONS.

4.4 Post Discharge and Return to Service

An authorized Firetrace distributor must be consulted after a system has discharged. The units must be removed and recharged. To remove the connected Firetrace Suppression unit(s) please refer to that unit's manual to return to service.