



DESIGN, INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

FOR

PRE - ENGINEERED AUTOMATIC INDIRECT EXTINGUISHER UNIT

**Models: ILP - 1 kg
ILP - 2 kg
ILP - 5 kg**

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P/N XXXXXX**

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1 FOREWORD

This Manual is written for the fire protection professional that designs, installs, and maintains Firetrace Pre - Engineered Automatic Indirect Units.

Firetrace Automatic Indirect Fire Suppression Units are to be designed, installed, inspected, tested, maintained, and recharged by qualified trained personnel in accordance with the following:

- All instructions, limitations, etc. contained in this Manual
- All information contained on the agent cylinder nameplate(s).
- Applicable parts of associated NFPA Standards.
- Local Authority having jurisdiction.

1.1 Warnings

Safety precautions are essential when any electrical or mechanical equipment is involved. These precautions should be followed when handling, servicing, and recharging Firetrace Fire Suppression Units and Equipment. 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 or 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.

1.2 Safety Precautions

The following safety precautions should always be followed:



WARNING

Pressurized (charged) cylinders are extremely hazardous and if not handled properly are capable of causing property damage, bodily injury, or death. Always wear safety glasses and make sure the discharge plugs are properly in place before unit installation, servicing, or other general handling.

1. Read and understand this Manual and the other documents referenced herein.
2. The valve discharge outlet safety plugs **MUST** be installed on the cylinder valve at all times and only removed when connected into the discharge tubing, or when performing charging, testing, or salvaging operations in accordance with the procedures contained in this Manual.
3. Wear safety glasses when working with pressurized cylinders and charging equipment.
4. Make sure that 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.
5. Follow all of the safety procedures included on the cylinder nameplate and in this Manual.
6. 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:

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2 INTRODUCTION

The Firetrace Indirect Automatic Fire Extinguisher Units are designed for total flooding and local applications.

Each installed pre-engineered unit is equipped with detection tubing, discharge piping, and nozzles. The pre-engineered concept minimizes the amount of engineering involved in the application design. When the discharge piping and nozzles are installed within the limitations stated in this Manual, no hydraulic calculations are required to determine pressure drop, agent flow, or discharge time.

The hazard being protected can be any size, shape, or volume provided that the hazard being protected is within the limitations described in this Manual. When installed, each extinguisher unit is a self-contained unit, meaning that it is equipped with its own automatic (non-electric) detection system. This system, when actuated, automatically releases the suppression agent into the hazard area.

Since the units are listed as automatic units (e.g. no simultaneous Manual or electric actuation means is provided), only one (1) extinguisher unit can be used to protect one hazard. These extinguisher units cannot be combined to protect a larger size hazard, since they are not designed to provide for simultaneous actuation of (2) or more units.

Local authorities having jurisdiction should be consulted as to the acceptability for particular hazards and requirements covering installation.

2.1 Agents

The Firetrace ILP Units can be filled with various agents to be selected based on the hazard and design factors for the intended application. The agents are:

- FM-200
- Novec 1230
- ABC Dry Chemical
- Class D (Copper)

2.2 Cleanliness

Each agent has specific properties, however, the intended agents for these systems can be generalized into two categories:

1. Clean Agents

- FM-200
- Novec 1230

** Which leave no residue and are electrically non-conductive.

2. Dry Powder

- ABC Dry Chemical
- Class D (Copper)

** Which require cleanup by one of the following: wiping, vacuuming, or washing exposed areas. In some cases the powder will have to be scraped off a surface if that surface was hot at the time of discharge.

3 SYSTEM DESCRIPTION

3.1 General

The Firetrace Indirect Extinguisher Units are available in 3 sizes

Model ILP-1 kg:	Charged with 2.2 lbs of Agent
Model ILP-2 kg:	Charged with 4.4 lbs of Agent
Model ILP-5 kg:	Charged with 11.0 lbs of Agent

Clean Agents:

These units are designed for use in Total Flooding applications only, where the hazard is normally unoccupied. The Firetrace Indirect Units can be used, but are not limited, to protect the following:

- Electrical and electronic cabinets.
- Telecommunication areas.
- Data Processing areas and cabinets.
- Other high value assets.
- Laboratory fume /exhaust cabinets
- Pump enclosures
- UPS units
- Flammable Chemicals storage cabinets
- Generator Enclosures
- Transformer Cabinets
- Computer/Data Storage Cabinets
- CNC & VMC Machining centers
- Many other applications

These clean agents are gaseous fire-extinguishing agents that are effective for use on:

- Class A – Surface type fires
- Class B – Flammable liquid fires
- Class C – Electrical equipment fires

The clean agents should not be used where the following materials may be present.

- Pyrotechnic chemicals containing their own oxygen supply.
- Reactive metals such as lithium, sodium, potassium, magnesium, titanium, zirconium, uranium and plutonium.
- Metal hydrides.
- Chemicals capable of undergoing autothermal decomposition, such as certain organic peroxides and hydrazine.

ABC Dry Chemical:

The Firetrace Indirect Units can be used, but are not limited, to protect the following:

- Laboratory fume /exhaust cabinets
- Pump enclosures
- Flammable Chemicals storage cabinets
- Generator Enclosures
- CNC & VMC Machining centers
- Many other applications

Dry Chemical Powder should not be used where the following materials may be present.

- Pyrotechnic chemicals containing their own oxygen supply
- Reactive metals such as lithium, sodium, potassium, magnesium, titanium, zirconium, uranium and plutonium
- Metal hydrides
- Chemicals capable of undergoing autothermal decomposition, such as certain organic peroxides and hydrazine

- Deep Seated or burrowing fires in ordinary combustibles where the dry chemical cannot reach the point of combustion

For hazards beyond the scope described above it is recommended that the designer consult with Firetrace and the local authority having jurisdiction as to the suitability on the use of these agents for particular hazards, for personnel exposure effects from the design concentration, and for installation requirements.

Firetrace Automatic Indirect Units consists of the following major components:

- Cylinder/Valve assembly
- Cylinder Mounting Bracket
- Firetrace detection/actuation tubing and fittings (No substitute)
- Discharge nozzles
- Pressure switch (Optional)
- Discharge piping and fittings (Furnished by others)

Once installed, the Firetrace Automatic Unit becomes a self-contained, self-actuating unit that does not require an external source of power or electricity.

The unit utilizes unique Firetrace flexible tubing that is attached to the top of the cylinder valve. This tubing is pressurized with dry nitrogen to maintain the cylinder valve in the closed position. This tubing acts as a continuous linear thermal detector that ruptures upon direct flame impingement or at high temperatures associated with fire conditions. Once the detection tubing is ruptured, the cylinder valve automatically opens, allowing the dry chemical to flow through the discharge piping, distributing the extinguishing agent through the nozzle(s) into the protected area.

Upon actuation the optional pressure switch can be used to indicate discharge, shutdown ventilation, close all openings, shut-off electrical power, etc. as may be required.

3.2 Component Descriptions

For a more comprehensive list of technical illustrations and part numbers, please see Appendix A.

3.2.1 Cylinder/Valve Assemblies

The agents are stored in aluminum cylinders pressurized with nitrogen. Each cylinder is equipped with a straight siphon tube and can only be mounted in a vertical (upright) position.

Each cylinder is equipped with a nickel plated brass valve, a pressure gauge to monitor cylinder pressure, and a quarter turn ball valve that interfaces with the Firetrace detector tubing. The ball valve must be kept closed at all times when the cylinder is not in service.

Each valve is also equipped with (2) discharge outlet ports. Each outlet port is provided with a safety plug that must be installed in the discharge outlet whenever a system is not in service. These plugs are safety devices designed to prevent uncontrolled discharge of the system in the event that the valve is accidentally actuated.



WARNING

The safety plugs must be installed in the valve discharge outlets at all times, except when connected into the units discharge tubing or when filling. Failure to follow these instructions could result in property damage, personal injury, or death.

3.2.2 Firetrace Flexible Detection/Actuation Tubing

The Firetrace Detection/Actuation Tubing is used as a combination linear heat detector and unit activation device to cause actuation of the unit. The tubing is installed throughout the hazard volume, with one end connected to the top of the cylinder valve. The tubing is pressurized with nitrogen while maintaining the ball valve in the "OFF" position. The detection tubing is heat sensitive and in a fire situation is designed to rupture at any point along its length upon direct flame impingement or at high temperatures associated with fire conditions.

The rupture of the tubing releases the nitrogen pressure causing the agent cylinder valve to actuate, resulting in complete discharge of the agent through the nozzles.

3.2.3 Manual Release

A Manual Release can be used with every system. This device consists of a yellow pull tab and a red plunger. Located on this device is a port for pressurizing the tubing and monitoring tubing pressure via the included Pressure Gauge.

3.2.4 Pressure Switch

A pressure switch is available as an optional part of the cylinder valve assembly and is connected directly into the pressurized portion of the cylinder valve. This pressure switch is used to monitor unit pressure, unit actuation, or to energize or de-energize electrically operated equipment.

An additional pressure switch is available and can be connected to an End of Line Adapter to provide additional electrical functions as may be required. Firetrace recommends that all units use a pressure switch coupled with some device to alert personnel in the event of discharge.

4 SYSTEM DESIGN AND LIMITATIONS

4.1 General

The Firetrace series of Pre-Engineered Automatic Indirect Units' design limits were established and tested by Firetrace.

The pre-engineered automatic unit concept minimizes the amount of engineering required when evaluating a design for a specific application. So long as the discharge piping and nozzles are installed within the limits prescribed in this Manual, no calculations are required for pressure drop, flow rates, or discharge time. When the additional limitations of hazard volume, area coverage, maximum height, design concentration, agent quantity, detector arrangement, etc., are also met, the unit installation can be understood to comply with the applicable design requirements of the associated NFPA Standard. Therefore, no discharge tests or concentration measurements should be required.

4.2 Specifications

4.2.1 Storage and Operating Temperature Range

The Firetrace Units and equipment are designed to be stored and operated at the ambient temperature range of -20°C to +60°C.

4.2.2 System Operating Pressure

The normal operating pressure for the unit is:

- 10 bar at 21°C [150 psi at 70°F] for FM-200 Systems
- 13.5 bar at 21°C [195 psi at 70°F] for Novec 1230 and Dry Powder Systems

4.3 Design Procedure

The following procedures should be used to design a Firetrace Pre-Engineered Automatic Indirect Fire Suppression Unit.

- a. Conduct a survey and analysis of the hazard to be protected.
- b. Determine the height, length, and width of the enclosure. Calculate the volume. All of these parameters must be within the dimensional limits specified in this Manual.
- c. Determine the anticipated minimum and maximum ambient temperatures expected within the enclosure to be protected.
- d. Determine the integrity of the enclosure and if any openings must be closed at the time of agent discharge.
- e. Determine the amount of agent needed for the enclosure volume.
- f. Determine the cylinder size required based on the hazard volume limitations and enclosure size.

- g. Determine the location of the system cylinder.
- h. Determine the location and quantity of nozzles required, based on the size and configuration of the enclosure.
- i. Determine the routing and quantity of discharge pipe required. The discharge pipe and fitting limitations must not be exceeded.
- j. Determine the arrangement and placement of the Firetrace detection tubing.
- k. Determine any auxiliary equipment requirements, such as a pressure switch(s) to sound alarms, shut-down ventilation, shut-off electrical power, etc.

4.4 Hazard Enclosure Limitations

4.4.1 Enclosure Size

The maximum dimensions for each size unit using Novec 1230 and FM-200 are shown in Table 4-2. The maximum dimensions for each size unit using ABC Dry Chemical are shown in Table 4-3. The protected enclosure can be any size, shape, or volume, provided that the dimensions do not exceed the limitations.

Model	ABC Agent (kg)	Volume (m ³)
Novec/FM-200 ILP-1kg	1.0	1
Novec/FM-200 ILP-2kg	2.0	2
Novec/FM-200 ILP-5kg	5.0	5

Table 4-2: Enclosure Volume Limitations for Novec 1230 and FM-200 Systems

Model	ABC Agent (kg)	Volume (m ³)
ABC ILP-1kg	1.0	4.5
ABC ILP-2kg	2.0	9.0
ABC ILP-5kg	5.0	22.5

Table 4-3: Enclosure Volume Limitations for ABC Dry Chemical



CAUTION

This unit is designed as an Automatic unit. No Manual or electric means is provided for simultaneous actuation of multiple units. Only one (1) unit can be used to protect one hazard. These extinguisher units cannot be combined to protect a larger size hazard since they are not designed to provide for simultaneous actuation of (2) or more units.

4.4.2 Ventilation Shut-Down and Uncloseable Openings

Provisions must be made to provide means to close all openings in the hazard enclosure and shut-off ventilation at the time of discharge if feasible.

The total area of uncloseable openings shall not exceed 1 percent of the total area of the sides, top, and bottom of the enclosure to use maximum protectable volume values in the above tables.

4.5 Nozzle and Discharge Pipe Requirements

4.5.1 Discharge Nozzle Limitations

The nozzle type can differ between agents. Be sure the nozzle selected is intended for the agent being stored within the system.

Each cylinder valve is equipped with 2 discharge ports (DP). Whether 1 or 2 discharge ports are used is dependant on the size and shape of the enclosure and the number of nozzles required to cover the specific hazard.

4.5.2 Maximum Discharge Piping and Fitting Limitations

The maximum piping and fitting limitations are shown in Table 4-3.

Discharge Ports Used (DP)	Nozzles Per DP	Total Number of Nozzles Per Unit	Max. Length Of Piping Per DP	Max. No. Of Elbows Per DP	Max. No. Of Tees Per DP
1	1	1	7 Ft (2.13 m)	1	0
2	1	2	7 Ft (2.13 m)	1	0
	2	4	7 Ft (2.13 m)	3	1

Table 4-3: Maximum Piping and Fitting Limitations

4.5.3 Piping Bends

Wherever possible, pipe bends should be used in lieu of 90° pipe elbows. It is recommended that a pipe bender be used when forming the 90° bends. The minimum bend radii shown in Table 4-4 should be used when forming the pipe bends in order to minimize the chance of flattening the pipe.

Pipe OD	Min. Bend Radius To Pipe Centerline	Equiv. Length Of Piping For 90° Bend (a), (b)
8 mm	$1\frac{1}{16}$ " R	1'- $\frac{1}{8}$ "
Notes: (a) The equivalent length of pipe is to be counted as part of the maximum length of pipe shown in Table 4-3. (b) 90° pipe bends are not required to be subtracted from the maximum number of elbows allowed in Table 4-3. (c) Min. Bend Radii were taken from Parker Industrial Tube Fittings Catalog 4300 March 1991		

Table 4-4: Minimum Pipe Bend Radius and Equivalent Length

4.6 Firetrace Detection/Actuation Tubing

For the Indirect Units, the Firetrace tubing is used as a combination heat detector and unit activation device to cause actuation of the System.

The detection/actuation tubing is heat sensitive and in a fire situation is designed to rupture at any point along the tube upon direct flame impingement or at high temperatures associated with fire conditions.

The maximum length of tubing that can be used for any ILP unit is 120 feet (36.58 m). Refer to Section 5.4 for installation instructions.

NOTE: It is recommended that the tubing not be placed horizontally adjacent to potential fire sources as this may significantly delay response time.

5 INSTALLATION INSTRUCTIONS

This section provides installation instructions covering components and limitations described in Section 3 and Section 4 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

System cylinder/valve assemblies must be handled, installed and service in accordance with the instruction contained in this Manual and on the cylinder nameplate. Failure to follow these instructions could result in property damage, severe injury, or death.



WARNING

Pressurized (charged) cylinders are extremely hazardous and if not handled properly are capable of causing property damage, bodily injury, or death. Always wear safety glasses and make sure the discharge plugs are properly in place before unit installation, servicing, or other general handling.

5.1 Cylinder/Valve and Bracket Assemblies

The system cylinders should be located as close as possible to the protected enclosure. In some cases the cylinder 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. The cylinders shall be located in an environment protected from the weather and where the temperature range is between -20°C to 60°C

The cylinder and bracket must be mounted in the vertical plane with the cylinder valve facing up and oriented so that the pressure gauge is facing out and away from the mounting wall to facilitate visual inspection.

Mount the cylinder where it will not be subjected to accidental damage or movement. Suitable protection must be installed where necessary to prevent damage or movement.



WARNING

Make sure that the ball valve, located on the top of the cylinder valve, is maintained in the "OFF" position and the discharge port safety plugs are kept in place until the system is secured in place and ready for connection of the discharge piping. Failure to follow these instructions will result in actuation and discharge of the cylinder contents.

1. Securely mount the cylinder bracket to structural support using 2 or more mounting holes.
2. Position the cylinder in the bracket with the pressure gauge facing out. Secure the cylinder in place using the bracket straps.

5.2 Discharge Piping and Nozzles

1. Locate the nozzle(s) following the guidelines and limitations described in this manual.
2. Determine the routing of the discharge pipe and whether one (1) or two (2) discharge ports will be used following the guidelines and limitations described in this manual. If two (2) discharge ports are used, verify that the pipe length from each discharge port does not exceed a 10% imbalance.
3. Remove one or two safety plugs from the valve discharge ports as required. Attach male connection fittings into each discharge port.
4. Install the discharge pipe and fittings between the cylinder and nozzle(s). Secure the pipe with the appropriate size pipe clamps as required.

5.3 Discharge Line Tees

Changes in direction of flow cause separation of expellant gas and dry chemical. To provide proper distribution of dry chemical upon splitting the stream special attention must be given to the method in which an approach is made to a tee after a change in direction. Certain acceptable methods are shown in Figure 5-1.

5.4 Firetrace Detection/Actuation Tubing

Location and spacing of the tubing is critical to the response time in the event of a fire. The tubing should be placed above the hazard areas being protected. The Typical Tubing Placement diagram, located in Appendix B, provides general guidelines for placement of the detection tubing along with the maximum spacing and height limitations. Depending on the configuration of specific hazards, the guidelines shown in the Typical Tubing Placement diagram may, or may not, be applicable. The maximum height that is allowed between layers is 3.28 feet (1 m), the maximum distance between passes is 21.12 inches (53.34 cm), and the maximum distance allowed from any wall to the tubing is 10.56 inches (26.82 cm). Refer to the Typical Tubing Placement diagram in Appendix B for further clarification.



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. Maximum length of detection tubing shall not exceed 120 Feet (36.58 m).

1. Secure the detection tubing using Mounting Tabs at 1.5 Ft (0.46 m) intervals.
2. Use the appropriate rubber/plastic grommets when the detection tubing is routed through sharp holes in order to prevent damage to the tubing.

5.5 Detection Tubing Fittings and Accessories

5.5.1 Spring Top Support Fittings

All compression fittings must be secured 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. Place the nut/spring top over the end of the tube with its threaded section towards the end of the tube.
3. Push the tube fully home onto the nipple fitting.
4. The nut should then be fastened finger tight and then using a 12mm wrench, fastened to a torque of 3-4.5 lbf*ft (4-6 N*m).
5. Loosen the connection and inspect the end to ensure a proper flange has formed. Reconnect and tighten down to ensure an effective seal.

For a more comprehensive list of Spring Top Support Fittings, refer to Appendix A.

5.5.2 Slip-On Fittings

All high pressure slip-on fittings must be secured 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. Pull lightly on the tubing and the brass outer ring should move outward slightly.

For a more comprehensive list of Slip-On Fittings, refer to Appendix A.

5.5.3 End of Line Accessories

All of the following accessories will connect to an End of Line Adapter. The End of Line Adapter can be installed by following the appropriate procedures in Section 5.5.1 or Section 5.5.2.

NOTE: End of Line Adapters are not designed to provide a lasting seal without the use of one of the following items:

Pressure Gauge

The Pressure Gauge must be installed with its included o-ring. Thread the pressure gauge into the End of Line Adapter so that the gauge indicates the tubing pressure.

Pressure Switch for End of Line Adapter

The Pressure Switch for the End of Line Adapter must be installed with its included o-ring and washer. Insert the washer into the End of Line Adapter, and then thread the Pressure Switch in until an audible "click" can be heard. The Pressure Switch is now active.

NOTE: Without installation of the included washer, the Pressure Switch will not be active.

End of Line Adapter Plug:

The End of Line Adapter Plug must be installed with its included o-ring. Thread the plug into the End of Line Adapter.

5.6 System Activation

1. Install the detection tubing, fittings, and accessories according to the procedures specified in Section 5.4 and Section 5.5.
2. With the system ball valve still closed, connect the detection tubing to the system using the appropriate procedure in Section 5.5.1 or Section 5.5.2.
3. Attach the filling adapter to the End of Line Adapter.
4. Using a regulated dry nitrogen supply, pressurize the detection tubing through the filling adapter. It is recommended to have a portable dry nitrogen cylinder or Firetrace Nitrogen Fill Kit for on-site use.
5. Remove the filling adapter and thread the pressure gauge & O-ring into its place to verify that the tubing is pressurized to correct level (pressure may have to be adjusted for temperatures higher or lower than 21°C).
6. With the gauge still attached to the filling adapter, test for leakage:
 - Apply soapy water solution to the cylinder valve connection, end of line adapter connection, and the pressure gauge connection. 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 5.5 and check the installation of all fittings and accessories.
7. If an optional pressure switch is to be installed in the EOL adapter, remove the pressure gauge and install the pressure switch according to the procedures in Section 5.5.3. Check pressure switch connection for bubble leaks using soapy water solution.
8. After confirming that there is no leakage within the detector tubing, SLOWLY rotate the ball valve lever counter clock wise to the "ON" position.



CAUTION

If the ball valve lever is opened abruptly, activation of the cylinder valve may occur, causing the unit to discharge.

9. Tamper proof the unit by removing the ball valve lever face and securing the lever in the "ON" position with a zip tie. Refer to the Tamper Proof Instruction in Appendix B.
10. If the optional Pressure Switch is installed on the valve or on the E.O.L, 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.
11. The unit is now fully armed and ready for use.

6 SERVICE AND MAINTENANCE INSTRUCTIONS



WARNING

Firetrace cylinder/valve assemblies must be handled, installed, inspected and serviced only by qualified and trained personnel in accordance with the instructions contained in this Manual, 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. Always wear safety glasses and make sure the discharge plugs are properly in place before unit installation, servicing, or other general handling.

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.

6.1 General

A regular program of systematic maintenance must be established for continuous, proper operation of all Firetrace 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.

6.2 Periodic Service and Maintenance Procedures

6.2.1 Monthly Inspection

Inspection by the owner or end user should verify the following:

1. The Suppression Unit is in its proper location.
2. The Manual Actuators are unobstructed.
3. The Tamper Indicator is intact.
4. The Maintenance Tag or Certificate is in place.
5. The Suppression Unit shows no physical damage or condition that might prevent operation.
 - a. This includes inspecting the detection tubing in the hazard area for abrasion, distortion, cuts, or dirt accumulation.
6. The Pressure Gauge is in the operable range.
7. The Nozzle Blow-off Caps are intact and undamaged (if applicable).
8. Neither the Protected Equipment nor the Hazard has been replaced, modified, or relocated.

6.2.2 Semiannual Inspection

Semiannual Inspection is to be performed only by a Certified Firetrace Distributor

1. Check to see that the hazard has not changed.
2. Inspect detection/actuation tubing, Manual releases, discharge piping, nozzles, signals, and all other auxiliary equipment.
3. Verify that the agent distribution piping is not obstructed.

APPENDIX A

System Parts List
Detection Line Parts List

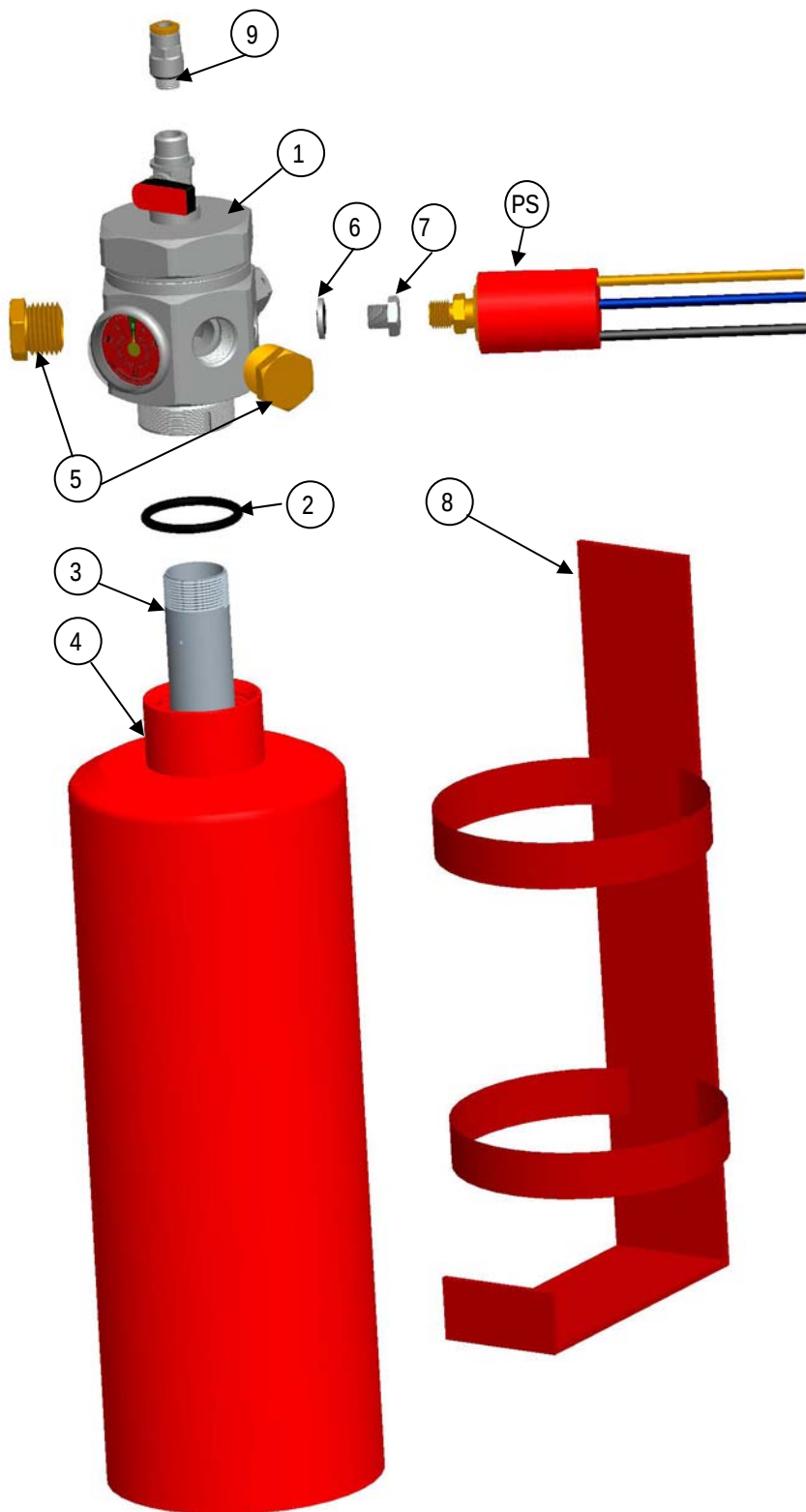
System Parts List

PRE-ENGINEERED AUTOMATIC INDIRECT EXTINGUISHER UNIT

Models

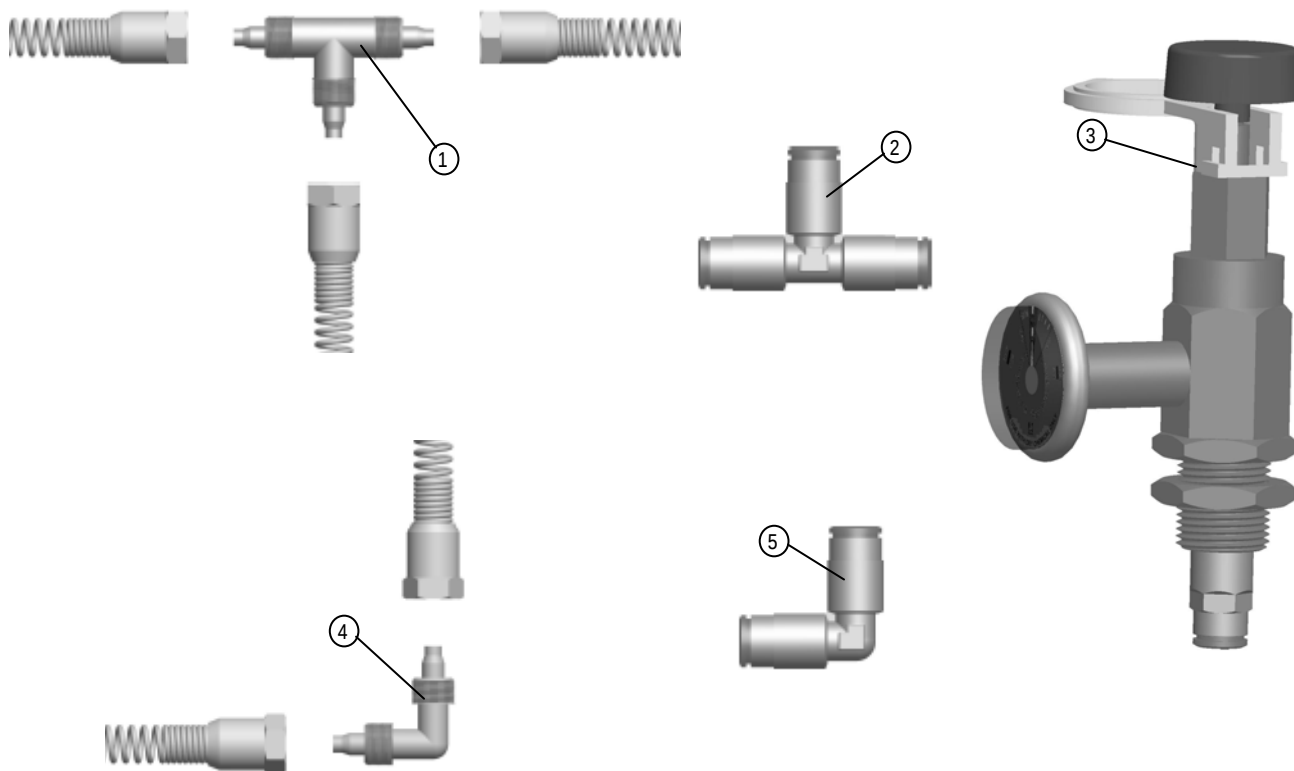
893502	1 kg FM-200 ILP
893902	1 kg Novec 1230 ILP
893202	1 kg ABC Dry Chem ILP
893401	1 kg Class D (Cu) ILP
893502	2 kg FM-200 ILP
893902	2 kg Novec 1230 ILP
893202	2 kg ABC Dry Chem ILP
893402	2 kg Class D (Cu) ILP
893505	5 kg FM-200 ILP
893905	5 kg Novec 1230 ILP
893205	5 kg ABC Dry Chem ILP
893405	5 kg Class D (Cu) ILP

ITEM	DESCRIPTION
1	Small CE ILP Valve
2	Collar O-Ring Small ILP
3	Siphon Tube
4	1 kg Low Pressure Cylinder
4	2 kg Low Pressure Cylinder
4	5 kg Low Pressure Cylinder
5	Small Discharge Port Plug
6	Bonded Seal
7	Pressure Switch Port Plug
8	1 kg Low Pressure System Bracket
8	2 kg Low Pressure System Bracket
8	5 kg Low Pressure System Bracket
9	HP Slip-on Union
PS	Pressure Switch
*	Nameplate: ILP
*	Label: Agent Type



Detection Line Parts List

ITEM NUMBER	PART NUMBER	DESCRIPTION	SYSTEM
*	200005	Firetrace Detection/Actuation Tubing (by the foot)	All Systems
*	200125	Tube Union With Spring Tops	All Systems
1	200126	Tube Tee With Spring Tops	All Systems
*	200136	Bulkhead With Spring Tops	All Systems
4	200155	Tube Elbow With Spring Tops	All Systems
*	200160	Spring Top	All Systems
*	200158	Tube Union Slip On Fitting	All Systems
2	200157	Tube Tee Slip On Fitting	All Systems
5	200178	Tube Elbow Slip On Fitting	All Systems
*	200179	Tube to Threads Union Slip On Fitting	All Systems
*	200177	Tube to Threads Tee Slip On Fitting	All Systems
*	200159	Tube to Threads Elbow Slip On Fitting	All Systems
*	200133	Tube Plug	All Systems
3	600063	Manual Release Dry Chemical With Slip-On Union	All Systems
*	200168	End Of Line Adapter With Slip-On Union	All Systems
*	200169	In Line Adapter With Slip-On Tee	All Systems
*	310303	Plug With O-Ring For End Of Line Adapter	All Systems
*	400013	Dry Chemical Pressure Gauge	All Systems
*	400004	Pressure Switch With Washer for End Of Line Adapter	All Systems
*	600090	Audible Alarm (Battery Operated) (Not part of FM/UL/ULC Approvals)	All Systems
*	200171	Mounting Tabs (Qty. 12)	All Systems
*	200150	Rubber Grommets (Qty. 2)	All Systems
*	200151	Plastic Grommets (Qty. 2)	All Systems
* PART NOT PICTURED			

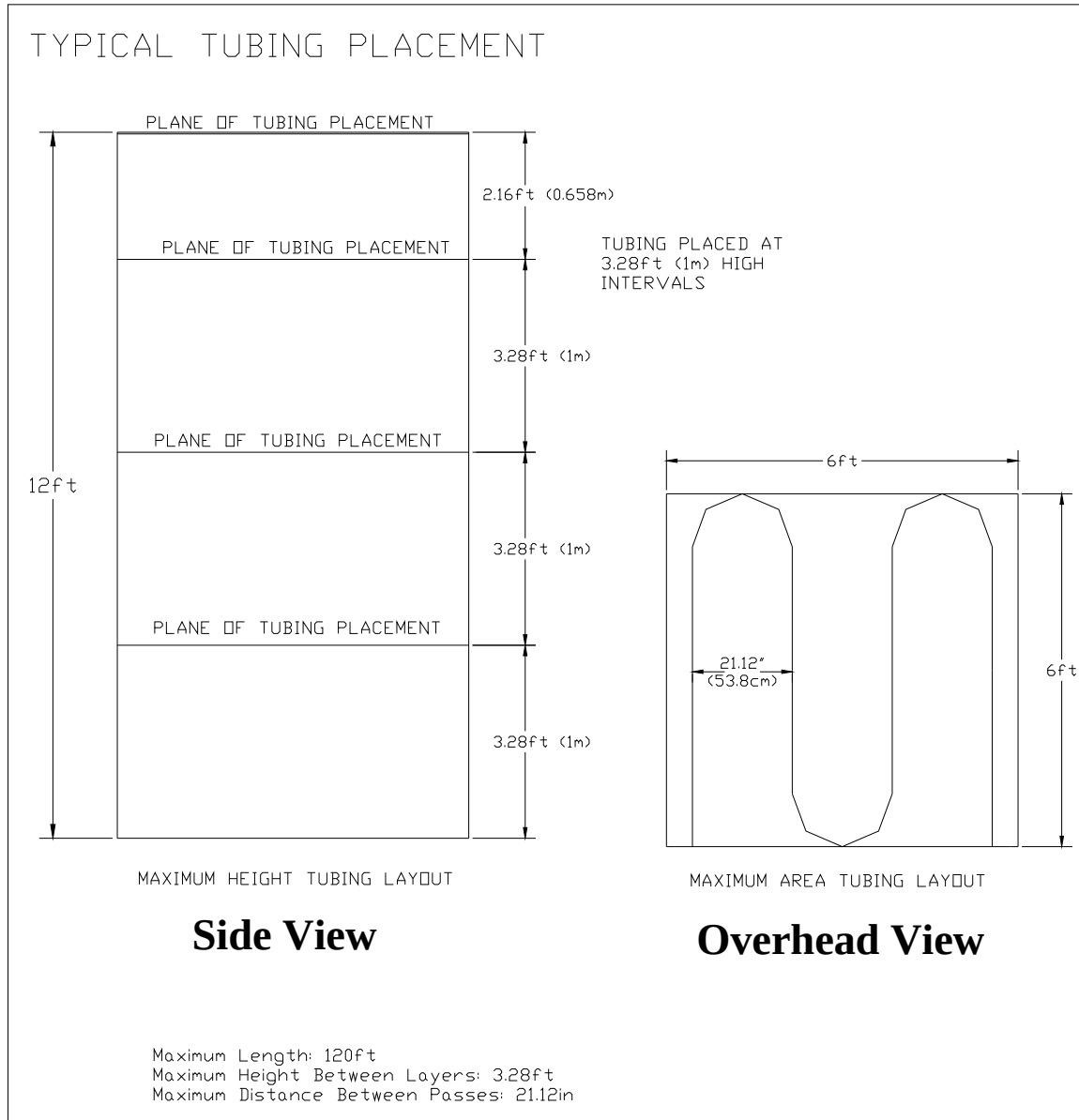


APPENDIX B

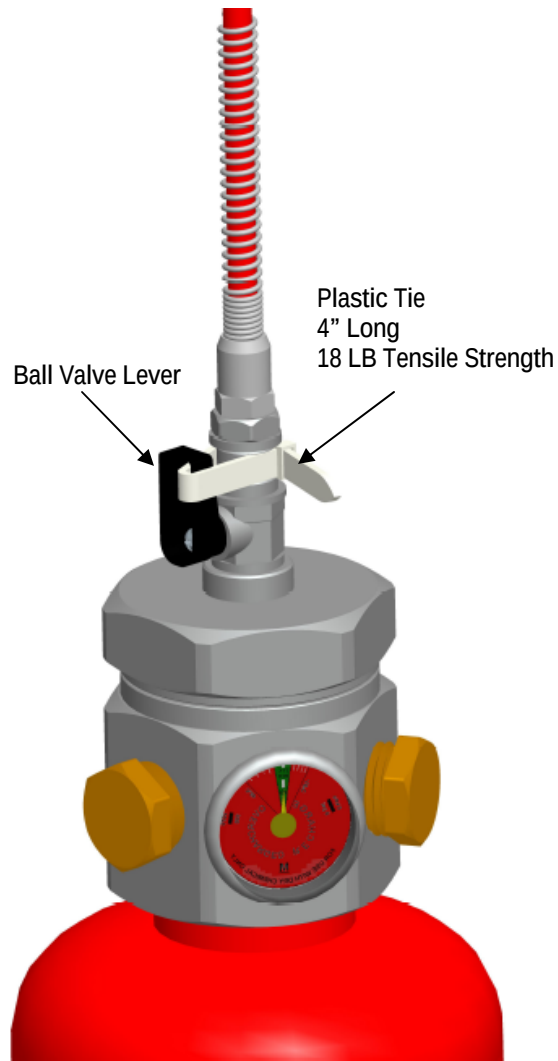
Typical Tubing Placement

Tamp Proof Options

Typical Tubing Placement



Tamper Proof Instruction



1. Check to see that the ball valve lever is set to the "ON" position.
2. Remove the ON/OFF faceplate.
3. Pull the tie through the hole in the ball valve lever.
4. Wrap the tie around the ball valve assembly.
5. Firmly pull on the tie to tighten and secure the lever.
6. If desired, cut off the excess tie.

REV	DESCRIPTION OF CHANGE	DATE
CE ILP DIOM Manual		
Firetrace International Ltd. Approved: Matt Sampson	DOCUMENT NUMBER	