



FK-5-1-12 Extinguishing Agent

**MUXXXXNVC-40FXX**  
Manual Only, Empty Bulb  
Sizes: 25-485 cu. ft.  
0.7-13.7 cu. m

Owner's Manual  
&  
Installation Instructions



APPROVED

Project ID: PR459721

U.S. Coast Guard Approved  
No. 162.029/256/0

Read and comply with all instructions, warnings and limitations before installing, servicing or removing this device.

Additional copies of this manual are available at no charge by contacting the manufacturer, distributor or dealer. Fireboy-Xintex reserves the right to change features without notice.

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## General Information

Fireboy Manual Only (MUXXXXNVC-40FXX) series Fire Extinguishing Systems are manufactured for **horizontal** mount in a broad range of applications, including marine, industrial, and commercial uses. This booklet is intended to outline the proper installation of the system for marine applications; most applications are similar. If further technical advice is required, information is available by contacting Fireboy-Xintex.

Fireboy FM Component Approved FK-5-1-12 Extinguishing Agent Systems are approved for use in normally occupied spaces and are approved for use within the European Union.

The National Fire Protection Agency defines normally occupied enclosure or space as “an enclosure or space where one or more persons are present under normal conditions.” (NFPA-2001).

SDS Sheets are available at no charge from the manufacturer and online at [www.fireboy-xintex.com](http://www.fireboy-xintex.com).

### Referenced Agencies:

Bureau Veritas  
3663 N. Sam Houston Pkwy. E., Suite 200  
Houston, TX 88034

National Fire Protection Agency  
1 Batterymarch Park  
Quincy, MA 02269-9101  
NFPA 2001, Standard on Clean Agent Fire Extinguishant Systems

FM Approvals  
1151 Boston Providence Turnpike  
Norwood, MA 02062

United States Coast Guard  
2100 Second Street SW  
Washington, DC 20593-0001

RINA  
10 Upper Belgrave Street  
London, SW1X 8BQ

**WARNING:**

1. NEVER INSTALL A FIREBOY SYSTEM ON THE UNDERSIDE OF A HATCH COVER OR ON AN ACCESS DOOR THAT MAY OPEN OR SEPARATE IN AN EXPLOSION.
2. NEVER INSTALL THE ACTUATOR OF A FIREBOY SYSTEM IN CLOSE PROXIMITY TO EXHAUST MANIFOLDS OR TURBOCHARGERS. RADIATED HEAT MAY CAUSE PREMATURE ACTUATION.
3. NEVER INSTALL THE MODELS LISTED IN THIS MANUAL VERTICALLY OR UPSIDE DOWN.
4. NEVER INSTALL A FIREBOY SYSTEM WHERE IT WILL TRAP OR BE IN DIRECT CONTACT WITH WATER.
5. NEVER INSTALL A FIREBOY UNIT IN A COMPARTMENT LARGER THAN ITS VOLUME RATING.
6. NEVER COMBINE THE VOLUME RATING OF TWO OR MORE FIREBOY UNITS TO PROTECT A GIVEN COMPARTMENT .
7. THIS DEVICE SHALL NOT BE INSTALLED OR USED IN AIRCRAFT AND/OR RACING VEHICLES.
8. DIESEL POWERED CRAFT MUST ALSO INSTALL THE AUTOMATIC ENGINE SHUTDOWN SYSTEM OR THIS SYSTEM MAY NOT EXTINGUISH THE FIRE (SEE ADDITIONAL EQUIPMENT).
9. FIREBOY SYSTEMS ARE NOT, NOR ARE THEY INTENDED TO BE, EXPLOSION SUPPRESSION DEVICES. THEY DO NOT LESSEN THE NEED TO INSPECT FOR FIRE HAZARDS AND TO VENTILATE ANY AREA WHERE FLAMMABLE FUMES MAY ACCUMULATE.
10. IN CASE OF ACCIDENTAL DISCHARGE, EVACUATE PROTECTED SPACE AND VENTILATE. DO NOT RETURN TO AREA UNTIL SPACE IS CLEAR OF AGENT. REFER TO THE HEALTH AND SAFETY SECTION (PAGE 22).

## Specifications

MUXXXXNVC-40FXX series extinguishers must be discharged manually at any temperature. All models introduce an atmospheric concentration of 6.11% into the protected space. This concentration includes a 30% safety factor to the 4.7% Minimum Extinguishing Concentration (MEC). Operational temperature range of extinguishers is 32°F (0°C) to 130°F (54°C).

Model Number	Protected Volume		Extinguisher Diameter		Extinguisher Height		Agent Weight		System Pressure (@70°F)
	ft <sup>3</sup>	m <sup>3</sup>	in	mm	in	mm	lbs	kgs	psi
MU0025NVC-40FXX	25	0.7	3.3	85	12.44	316.0	1.4	0.6	360
MU0050NVC-40FXX	50	1.4	4.3	110	18.49	469.6	2.8	1.3	360
MU0075NVC-40FXX	75	2.1	4.3	110	18.49	469.6	4.2	1.9	360
MU0100NVC-40FXX	100	2.8	5.1	130	20.17	512.3	5.6	2.5	360
MU0125NVC-40FXX	125	3.5	5.1	130	20.17	512.3	7.0	3.2	360
MU0150NVC-40FXX	150	4.2	5.1	130	20.17	512.3	8.4	3.8	360
MU0175NVC-40FXX	175	5.0	6.3	160	20.23	513.8	9.8	4.4	360
MU0200NVC-40FXX	200	5.7	6.3	160	20.23	513.8	11.3	5.1	360
MU0225NVC-40FXX	225	6.4	6.3	160	20.23	513.8	12.7	5.8	360
MU0250NVC-40FXX	250	7.1	7.1	180	19.93	506.2	14.1	6.4	360
MU0275NVC-40FXX	275	7.8	7.1	180	19.93	506.2	15.5	7.0	360
MU0300NVC-40FXX	300	8.5	7.1	180	22.25	565.2	16.9	7.7	360
MU0325NVC-40FXX	325	9.2	7.1	180	22.25	565.2	18.3	8.3	360
MU0350NVC-40FXX	350	9.9	7.1	180	30.28	769.1	19.7	8.9	360
MU0375NVC-40FXX	375	10.6	7.1	180	30.28	769.1	21.1	9.6	360
MU0400NVC-40FXX	400	11.3	7.1	180	30.28	769.1	22.5	10.2	360
MU0450NVC-40FXX	450	12.7	7.1	180	30.28	769.1	25.3	11.5	360
MU0485NVC-40FXX	485	13.7	7.1	180	30.28	769.1	27.3	12.4	360

All above models are approved under U.S.C.G. # 162.029/256/0

When specifications listed on the label differ from this manual, the information listed on the label is correct.

360psi = 2482kPa = 24.8Bar

## PED Data

Maximum System Pressure (PS): 25ft<sup>3</sup> - 485 ft<sup>3</sup>: 34.7 Bar

System Temperature (TS): 32°F - 130°F (0°C - 54°C)

Fluid Group: 2

Manual operation of MUXXXXNVC-40FXX Systems

1. Close all hatches leading to the protected compartment.
2. Shutdown all forced ventilation devices, engines, generators and electrical systems.
3. Remove the safety pin from the "FIRE" T-handle and pull firmly.

Signs of actuation

1. A loud sound like small arms fire.
2. A loud sound of rushing air.
3. The green indicator lamp is not illuminated.
4. A stalled engine.

When actuation occurs

1. Immediately shutdown all engines, powered ventilation, and electrical systems.
2. Extinguish all smoking materials.
3. Do not open the engine compartment.
4. The protected space may see an increase in pressure during discharge. Appropriate relief vents may be needed where structural integrity of protected space is in question.

After actuation

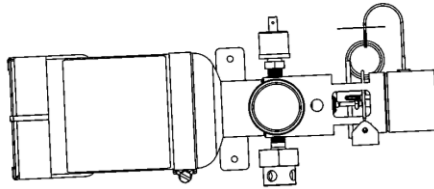
1. Before inspecting for damage, allow the agent to "soak" the compartment for at least 15 minutes and wait for hot metals or fuels to cool.
2. Have approved portable extinguishers in hand and ready for use.
3. Do not breathe fumes or vapors caused by the fire and/or suppression agent. They are hazardous and toxic. Refer to Health and Safety section (Page 22).
4. Forced ventilation will often be necessary. Care should be taken to readily dissipate hazardous atmospheres and not merely move them to another location. Consideration should be given to exhaust paths when opening or venting the enclosure after discharge. Ventilation should not be directed near any area that might be used as a gathering spot for personnel.

Before Installation

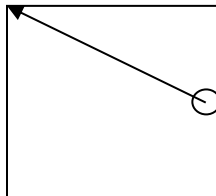
1. Check the system for damage during shipment.
2. Check the pressure gauge to be sure the gauge pointer lies within the green zone at 70°F (21°C).
3. The correct weight is shown on the label for the appropriate model.
4. Select an interior location not directly subject to weather or seawater.
5. Confirm the volume of the compartment to be protected in cubic feet or cubic meters by multiplying the width, by the length, by the depth at the keel; make no deductions for installed equipment.
6. Verify calculated volume with volume shown on label and model specifications section.

Selecting a Location

1. Do not install a Fireboy system rated for less cubic volume than the volume of the compartment to be protected.
2. The maximum approved distance from the cylinder nozzle to ceiling is 24in (610mm).
3. Location:
  - Extinguisher must be mounted with a minimum of 2.5° from horizontal and a maximum of 10°.



- Install on the forward or aft vertical bulkhead of the engine compartment as near to the centerline of the vessel (keel) as possible.
  - To prevent accelerated corrosion, do not mount directly to an aluminum/metal surface. Maintain galvanic isolation between the extinguisher and metal mounting surface.
  - Direct the actuator into unobstructed space.
  - Avoid installing athwart ship (perpendicular to the keel) on sailboats
4. The approved ceiling height of the protected space is 2.0ft (0.7m) to 6.41ft (2.0m).
  5. The maximum approved radial reach and area of coverage is 12.0ft (3.7m), 114.5ft<sup>2</sup> (32.8m<sup>2</sup>).



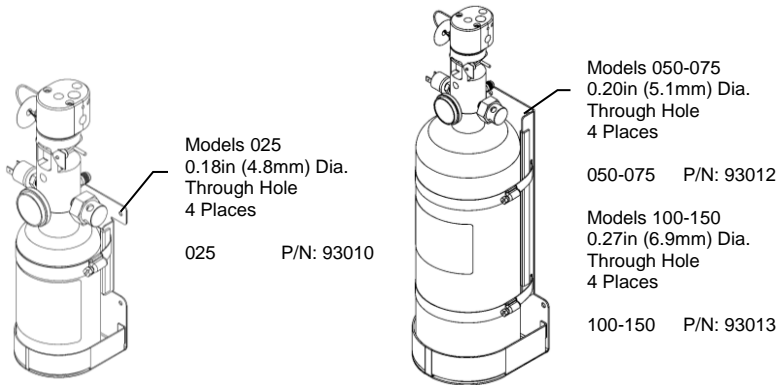
## Mounting Fireboy system

### DANGER:

ACCIDENTAL DISCHARGE DURING HANDLING OR INSTALLATION MAY CAUSE SERIOUS INJURY. DO NOT LIFT, CARRY, OR HANDLE BY VALVE, PRESSURE SWITCH, OR CABLE. WEAR EYE PROTECTION WHEN INSTALLING OR SERVICING CYLINDER. REFER TO THE HEALTH AND SAFETY SECTION (PAGE 22).

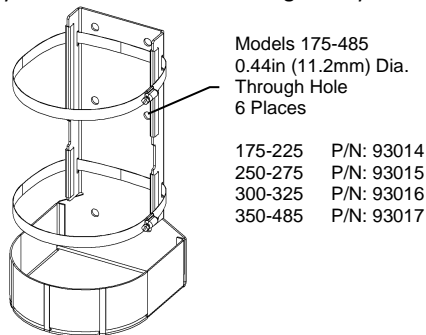
#### Models 025-150

1. Use appropriate size and length bolts and lock washers and secure using all 4 mounting holes.
2. Mounting hardware can be installed with cylinder clamped in bracket.



#### Models 175-485

1. Generously loosen cylinder clamps and remove cylinder.
2. Locate cylinder in safe and secure location to prevent cylinder from tipping.
3. Use appropriate size and length bolts and lock washers and secure bracket using all 6 mounting holes.
4. With bracket secured, place cylinder back in bracket and tighten cylinder clamps.





Cable Installation (P/N: E-4209-XXX, XXX = Length in Feet)

**WARNING:**

1. ALL FIREBOY MU SYSTEM INSTALLATIONS MUST USE ONLY GENUINE FIREBOY CABLES AND ASSOCIATED COMPONENTS THAT ARE ENGINEERED SPECIFICALLY FOR THIS APPLICATION. NOTHING ELSE WILL PROVIDE THE INTENDED DEGREE OF SAFETY AND RELIABILITY INHERENT IN THESE SYSTEMS.
2. ANY SUBSTITUTION WILL VOID ALL LABORATORY AND COAST GUARD APPROVALS AND FIREBOY-XINTEX WARRANTIES, AND MAY RESULT IN AN INOPERATIVE SYSTEM, AND UNSAFE AND HAZARDOUS CONDITIONS.
3. NEVER INSTALL A MANUAL RELEASE HANDLE IN THE SPACE TO BE PROTECTED.
4. NEVER INSTALL A CABLE ON A CU SERIES. FOR USE ON MU SERIES ONLY.

**NOTE:**

1. IF A DUAL RELEASE ADAPTER (DRA-1001) IS TO BE USED WITH THIS INSTALLATION, FOLLOW THE INSTRUCTIONS ENCLOSED WITH THAT UNIT AT THIS TIME.
2. FACTORY MUTUAL AND THE USCG REQUIRE MANUAL ACTUATION CABLES FOR ALL INSTALLATIONS OVER 1000 CU.FT.
3. AMERICAN BOAT AND YACHT COUNCIL STANDARD A-4 STATES THAT FIXED FIRE EXTINGUISHING SYSTEMS SHALL BE CAPABLE OF BOTH AUTOMATIC AND MANUAL OPERATION.

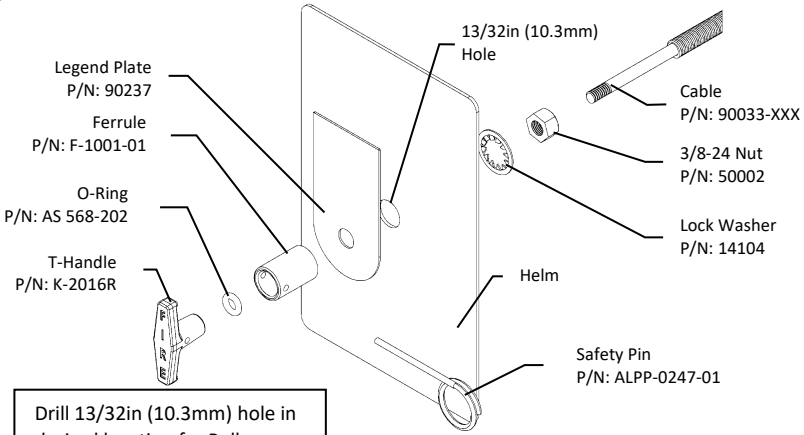
**CAUTION:**

DO NOT CONNECT CABLE TO CYLINDER AT THIS TIME!

## Routing the Cable

1. Locate the legend plate (1.9in (48mm) x 3.6in (92mm) with 7/16in (11.1mm) hole) for the manual release handle.
  - On a solid and secure surface (Minimum of ¼in (6.4mm) thick)
  - In full view of the operator
  - With enough clearance for the cable ferrule to extend approximately 12in (304.8mm) behind the panel
  - Angle Adaptor CAA-0285-01 available where clearance is limited
2. Using the legend plate as a template, locate and drill a 13/32in (10.3mm) hole.
3. Route the cable in the most direct manner, with as few bends as possible, to the cylinder location.
  - Do not bend in a radius of less than 6in (152.4mm) (a 12in (304.8mm) circle)
  - Follow the same route as manufacturer installed cables, if possible (Example: Steering, throttle, and transmission cables)
  - Do not subject cable to pinching or crushing, rubbing, extreme vibration, sharp bending or kinking, or extremes of heat or cold
  - Do not exceed 1440° of total bends (Example: 16 bends x 90° = 1440°)
  - Use the shortest allowable cable whenever possible
  - Maximum manual cable length is 100ft (30.5m)
4. Secure loose sections of the cable with the included nylon clamps.
  - Do not clamp cable in a bend
  - Do not crush cable with clamps

**Legend Plate and T-Handle**



Drill 13/32in (10.3mm) hole in desired location for Pull Station.

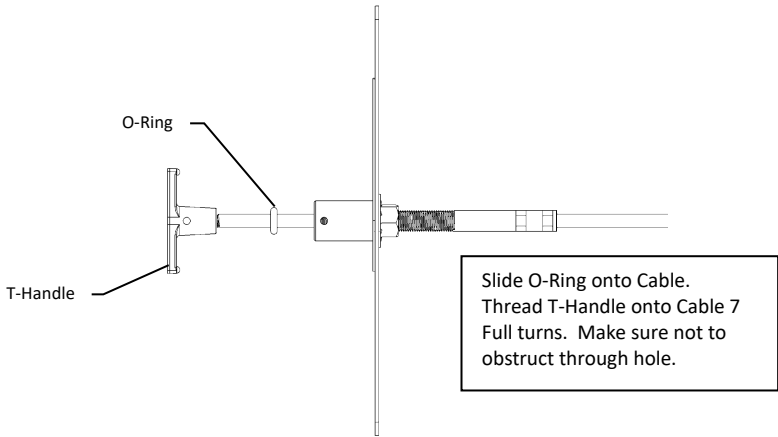
Peel off paper and press legend plate firmly in place. Install 3/8-24 Nut and Lock Washer on Cable and position through hole. Leave enough space to tighten later.

NOTE: Temperature must be above +50°F (10°C) for proper adhesion.

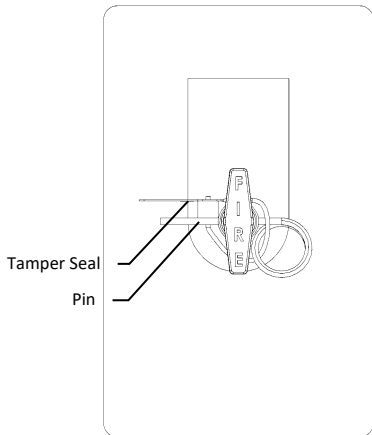
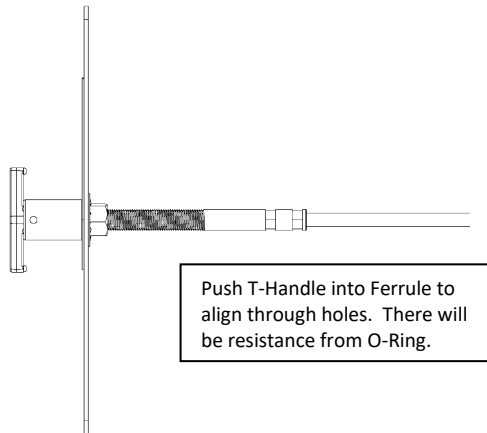
Note: Do NOT thread further than Ferrule's internal threads.

Thread Ferrule onto Cable using 3 full revolutions. Adjust Ferrule so that holes are parallel to the floor and tighten Nut.

Legend Plate and T-Handle Continued



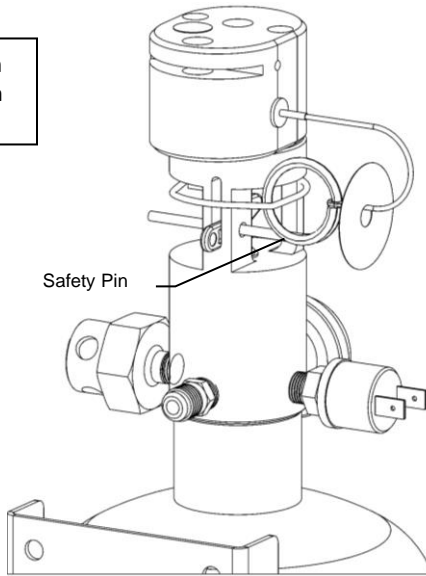
With Cable **DISCONNECTED** from extinguisher, take this time to test Cable operation. Cable should slide freely.



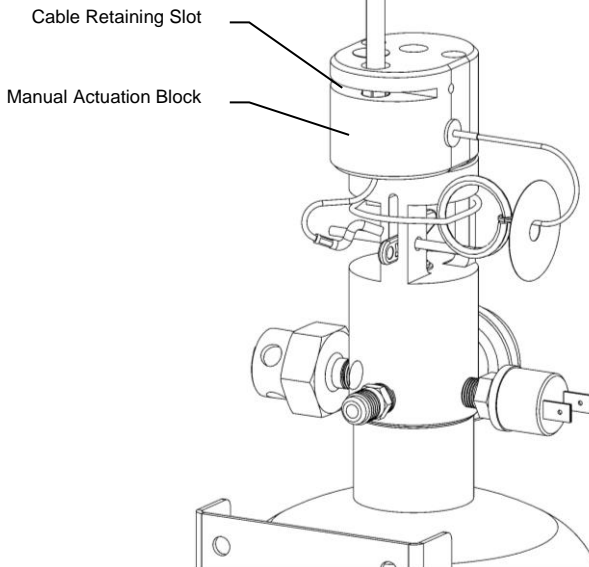
Insert Pin into Ferrule and T-Handle through holes. Wrap Tamper Seal through loop of Safety Pin and around Ferrule. Insert end of seal into side marked "ENTER" and pull tight.

## Connecting Cable to Cylinder

Instructions shown  
vertical orientation  
for clarity.

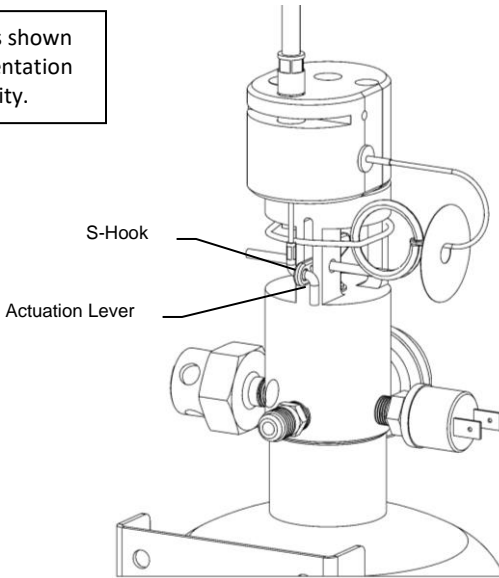


Extinguisher should be securely mounted, and Cable should be routed.  
Be sure the Safety Pin is in place.

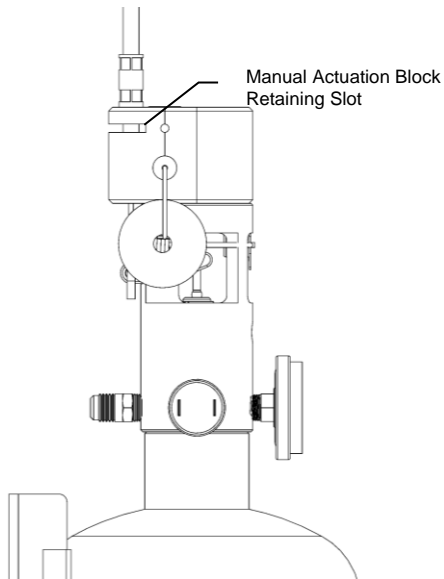


Insert extinguisher end of Cable through hole in Manual  
Actuation Block past retaining slot on Cable.

Instructions shown  
vertical orientation  
for clarity.



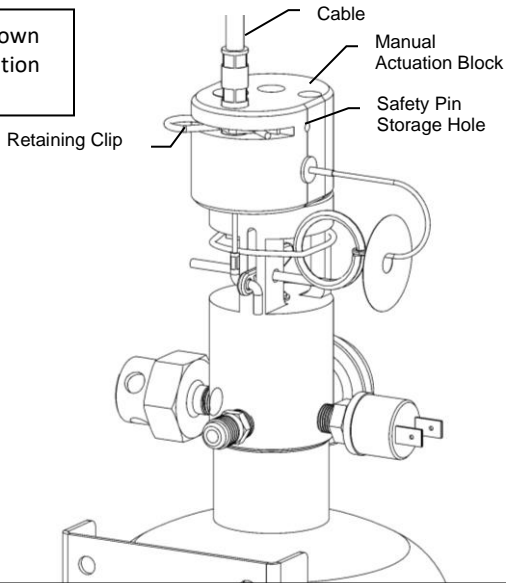
Insert S-Hook into hole of Actuation Lever.



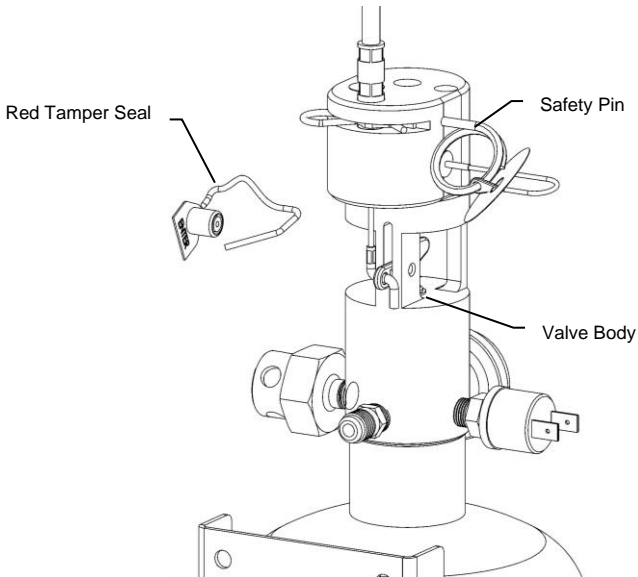
Align retaining slot of Cable with retaining slot of Manual  
Actuation Block.

## Connecting Cable to Cylinder Continued

Instructions shown  
vertical orientation  
for clarity.



Secure Cable into Manual Actuation Block with Retaining Clip.



With T-Handle previously secured, remove Red Tamper Seal from Extinguisher to remove Safety Pin and store in provided hole. Cable system is now operational.

**WARNING:**

FAILURE TO INSTALL AN ENGINE SHUTDOWN BOX WITH A FIREBOY SYSTEM IN ANY DIESEL ENGINE APPLICATION IMPEDES THE FIRE EXTINGUISHER AND MAY PREVENT FIRE EXTINGUISHMENT.

1. Automatic Engine Shutdown units are available through your Fireboy-Xintex distributor, dealer or retailer in three, five, six, eight, and ten circuit models.
2. Follow the installation instructions included with the Automatic Engine Shutdown for proper installation.
3. Technical Support for Automatic Engine Shutdowns is available by calling Fireboy-Xintex or visiting our website at [www.fireboy-xintex.com](http://www.fireboy-xintex.com).



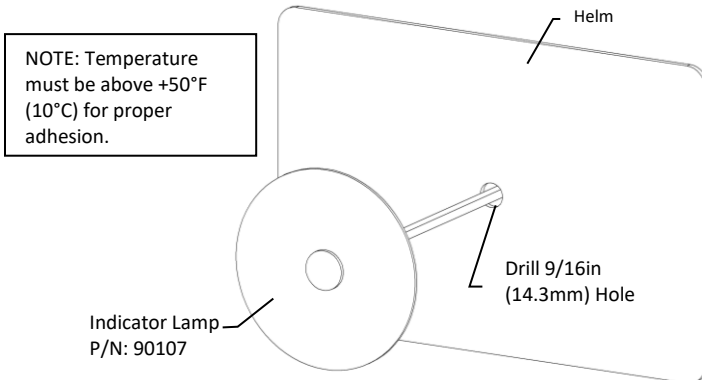
**NOTE:**

CONSULT A QUALIFIED ELECTRICIAN IF YOU HAVE ANY DOUBTS ABOUT YOUR ABILITY TO SAFELY AND PROPERLY COMPLETE THE WIRING. MONITORING SYSTEMS VARY AND THE DIRECTIONS BELOW MAY NOT APPLY.

- The Fireboy System indicator lamp is designed to announce to the helmsman the state of the fire extinguisher when the ignition key is in the ON position.
- A GLOWING green light indicates the Fireboy system is CHARGED.
- A NON-GLOWING light indicates the Fireboy system is DISCHARGED.

Mounting Indicator Lamp

1. U.S. Coast Guard Rule 162.029 requires an indicator lamp and legend plate at each helm position from which the craft may be operated.
2. Your Fireboy System is supplied with one (1) indicator lamp and legend plate. Additional indicator lamps and legend plates are available factory direct, or through an authorized dealer.
3. Select an appropriate location for the indicator lamp and legend plate on or near the instrument panel at the helm and in full view of the operator.
4. Drill a 9/16in (14.3mm) hole.
5. Remove the backing paper on the legend plate.
6. Feed both wires through 9/16in (14.25mm) hole.
7. Press legend plate firmly press in place.



**NOTE:**

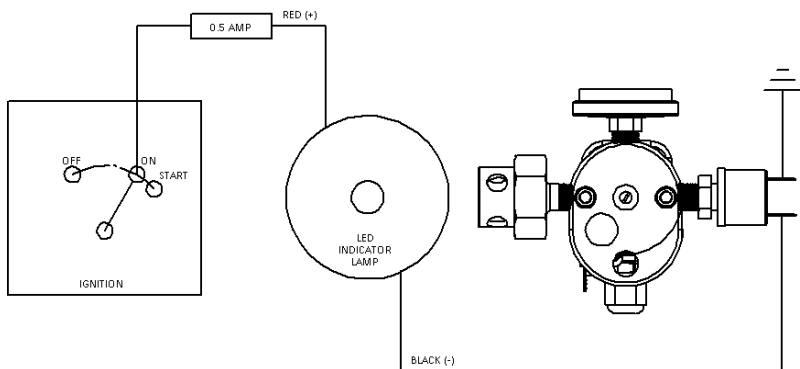
THE INDICATOR LAMP SUPPLIED IS FOR 12/24V DC USE

**WARNING:**

- AN ELECTRICAL SHORT MAY RESULT IN ELECTRICAL BURN, INJURY OR FIRE
- BEFORE ATTEMPTING TO WIRE THE INDICATOR LAMP, TURN OFF ALL ELECTRICAL CURRENT TO THE IGNITION SWITCH
- ALL FIREBOY WIRING MUST COMPLY WITH THE AMERICAN BOAT AND YACHT COUNCIL STANDARD E-11, TITLED AC AND DC ELECTRICAL SYSTEMS ON BOATS, AVAILABLE FROM ABYC, WWW.ABYCINC.ORG

Wiring Indicator Lamp

1. Review all wiring instructions below.
2. Consult a qualified marine electrician if you have any doubts about your ability to safely and properly complete the wiring. Ignition systems and electrical systems vary from boat to boat, and the directions which follow, may not apply to your boat.
3. Assemble the supplies you will need that are not included with your Fireboy System.
  - The necessary length of insulated 16 gauge (minimum) stranded wire
  - A one-half (0.5) ampere in-line fuse and fuse holder or circuit breaker
  - Properly sized insulated crimp-on wire connectors
4. Connect one lead of the fuse to the "ON" position of the starter switch.
5. Connect the other lead of the fuse to the red (+) wire of the LED indicator lamp.
6. Connect the black (-) wire of the indicator lamp to one of the pigtail wires on the Fireboy System (as shown below).
7. Do not reverse red and black wire, indicator lamp will not function.
8. Connect the remaining wire from the Fireboy system to ground.



## Connecting to Powered Ventilation

Engine compartments not equipped with a powered ventilation system require no further wiring.

If the engine compartment is equipped with a powered ventilation system, U.S. Coast Guard Rule 162.029 requires that the ground connection of the ventilation system be connected to the Fireboy system.

### **CAUTION:**

FAILURE TO CONNECT A POWERED VENTILATION SYSTEM IN THE MANNER DESCRIBED BELOW IMPEDES FIRE EXTINGUISHER AND MAY PREVENT FIRE FROM BEING EXTINGUISHED.

#### Powered Ventilation Systems (Blowers)

1. Determine the maximum current draw of the powered ventilation system.
2. For current draw not exceeding 5 amps connect the negative (-) wire from the ventilation blower to the pressure switch at the same point as the indicator lamp.
3. For current draw exceeding 5 amps, use a Fireboy Automatic Engine Shutdown system.

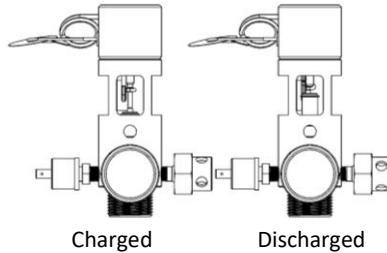
### **NOTE:**

IT IS NOT REQUIRED TO USE THE LEGEND PLATE LED INCONJUNCTION WITH AN ENGINE SHUTDOWN SYSTEM, WHICH IS SUPPLIED WITH AN INDICATOR THAT DISPLAYS SIMILAR DATA.

<b>INSTALLATION CHECKLIST</b>	
Verified Volume of Protected Space	
Verified Extinguisher Model is for Volume of Protected Space	
Mounted Extinguisher according to installation instructions	
Located extinguisher according to installation instructions	
Orientated extinguisher according to installation instructions	
Nozzle is no greater than 24in (610mm) from ceiling	
Secured Bracket according to installation instructions	
Installed Cable According to installation instructions	
Located Manual Release Handle according to installation instructions	
Routed Cable according to installation instructions	
No more than Sixteen 90° Bends (16 x 90° = 1440°)	
Secured Cable according to installation instructions	
Installed Manual Release Handle according to installation instructions	
Connected Cable to extinguisher according to installation instructions	
Removed Safety Pin on Extinguisher (System is operational)	
Installed Indicator Lamp According to installation instructions	
Located Indicator Lamp according to installation instructions	
Mounted Indicator Lamp according to installation instructions	
Wired Indicator Lamp according to installation instructions	
Review Maintenance of system	
Review Health and Safety Section of manual	
Installed Fireboy Automatic Engine Shutdown if required	

## Maintaining Fireboy Fire Extinguisher

1. Inspect the pressure gauge and the system daily. Pointer must indicate in green zone at 70°F (21°C).
2. Compare actuator to illustration below to determine if the extinguisher is charged or discharged.



3. Remove and weigh the complete unit (without brackets) on a certified scale every six (6) months and record on tag provided.
4. Remove fire extinguisher from service immediately for repair or replacement if measured gross weight is greater than 5% below what is stated on unit's label (Label Gross Weight x 0.95 = Minimum Allowable Weight).
5. Inspect cylinder in accordance with CUA C-6, every 5 years OR have cylinder hydrostatic tested every 12 years.

## Disconnection and Inspection of Manual Discharge Cable

### **DANGER:**

ACCIDENTAL DISCHARGE DURING HANDLING, INSTALLATION OR INSPECTION MAY CAUSE SERIOUS INJURY. WEAR EYE PROTECTION WHEN INSTALLING OR SERVICING FIRE EXTINGUISHER OR DISCHARGE CABLE.

Inspect manual discharge cable annually when inspecting the fire extinguisher.

1. Do not remove the safety pin on the T-handle when disconnecting the manual discharge cable from the fire extinguisher manifold.
2. Carefully reinstall safety pin through actuation lever. Safety pin should secure actuation lever in Valve Body. (See Page 13)
3. Remove the retaining clip securing the cable located at the slot in the top of the manifold. (See Page 15)
4. Carefully push the cable from the backside of the manifold towards the Actuation Lever far enough to allow the flexible center strand to bend.
5. Remove the "S" hook from the actuation lever.
6. Once the "S" hook is free of the actuation lever, pull the cable out and away from the manifold.

To reconnect the manual discharge cable to the cylinder, refer to "Connecting Cable to Cylinder" section of this manual.

## Maintaining the Indicator Lamp Circuit

Should the indicator lamp fail to come ON when the ignition key is ON

1. Check the pressure gauge and actuator to see if the system has adequate pressure or has been discharged.
2. Check fuse.
3. Using a continuity tester, check the electrical pressure switch on the system bottle itself:
  - Pull the connectors off the spade terminals and place the probes of the continuity tester directly on the spade connectors
  - A closed circuit indicates a functioning pressure switch
4. Check the continuity of the remaining wiring circuit.
5. The indicator lamp is an LED (light emitting diode) and cannot be tested with a continuity tester. A simple method to test LED's is to remove the lamp and touch the Red wire to the + terminal and the black wire to the – terminal of an ordinary 9-volt battery.
6. Should the continuity of the pressure switch indicate an open circuit, the system will have to be returned to the factory for either replacement or repair, depending upon the model involved.

## Health and Safety

- A properly designed and installed suppression system should not present any significant health or safety problems; however, there are basic precautions to be taken to avoid accidents, and aspects of the system operation that should be fully understood.
- FK-5-1-12 Extinguishing Agent extinguishes fires by causing a cooling effect and by causing a chemical reaction with the combustion products and not by displacement of oxygen as is the extinguishment method of carbon dioxide. The agent therefore provides the ability to utilize the FK-5-1-12 Extinguishing Agent system in occupied areas.
- FK-5-1-12 Extinguishing Agent can decompose at high temperatures to form halogen acids. If so, their presence is readily detected as a sharp, pungent odor long before hazardous maximum exposure levels are reached.
- The noise created by the FK-5-1-12 Extinguishing Agent discharging can be loud enough to startle people in the vicinity but is unlikely to cause any permanent injury. Turbulence caused by high velocity discharge can dislodge substantial objects directly in its path and cause enough general turbulence within the protected area to move paper and light objects.
- Direct contact with the vaporizing liquid discharged from an FK-5-1-12 Extinguishing Agent nozzle has a cooling effect on objects and in extreme cases can cause frostbite to the skin. The liquid phase vaporizes rapidly when mixed with air and therefore limits the risk to the immediate vicinity of the nozzle. Reduction in visibility will occur due to the condensation of water vapor.

**WARNING:**

THE DISCHARGE OF CLEAN AGENT SYSTEMS TO EXTINGUISH A FIRE CAN RESULT IN A POTENTIAL HAZARD TO PERSONNEL FROM THE NATURAL FORM OF THE CLEAN AGENT OR FROM THE PRODUCTS OF COMBUSTION THAT RESULTS FROM EXPOSURE OF THE AGENT TO THE FIRE OR HOT SURFACES. TO AVOID SERIOUS PERSONAL INJURY, UNNECESSARY EXPOSURE OF PERSONNEL TO THESE POTENTIAL HAZARDS MUST BE AVOIDED.

HMIS: 0-0-1/DODECAFLUORO-2-METHYLPENTAN-3-ONE/CONTENTS UNDER PRESSURE. 0-0-0/NITROGEN EXPELLANT GAS/VERY COLD, CONTENTS UNDER PRESSURE. CONSULT 3M ELECTRONICS MARKETS MATERIALS DIVISION, 3M CENTER, ST. PAUL, MN 55144-1000; EMERGENCY PHONE: 1-800-364-3577.

**First Aid**

- Skin** Maintain at body temperature, thaw affected area with gentle heat. If frostbite occurs, seek medical assistance. Do not rub affected area.
- Eyes** Apply gentle heat. Do not allow patient to touch affected area, seek medical assistance.

For more information on FK-5-1-12 Extinguishing Agent , please see the SDS (Page 25).

**DANGER:**

1. DO NOT HANDLE BY ACTUATOR
2. DO NOT DROP
3. KEEP AWAY FROM CHILDREN
4. KEEP AWAY FROM EXTREME HEAT
5. DO NOT DISCHARGE ANY FIREBOY AUTOMATIC OR MANUAL/AUTOMATIC SYSTEM UNLESS SECURELY FASTENED IN ACCORDANCE WITH THE OWNER'S MANUAL
6. NEVER ATTEMPT TO MANUALLY DISCHARGE A CU FIREBOY SYSTEM
7. NEVER ATTEMPT TO DISASSEMBLE ANY COMPONENT OF THIS SYSTEM
8. ALWAYS WEAR EYE, FACE AND BODY PROTECTION WHEN INSTALLING, REMOVING OR WORKING IN THE IMMEDIATE VICINITY OF THIS SYSTEM

**Principle health hazards**

- Death without warning if high concentrations are inhaled
- Reduced oxygen available for breathing
- Frostbite from direct exposure
- Increased susceptibility to the toxicity of excess exposure for individuals with pre-existing diseases of the central nervous system, cardiovascular system, lungs or kidneys
- Toxic by-products are produced when this agent extinguishes fire

Medical instructions

- If high concentrations are inhaled, immediately move the exposed to fresh air and keep calm
- If not breathing, give artificial respiration. Seek medical assistance
- If breathing is difficult give oxygen. Seek medical assistance
- In case of skin contact immediately flush skin with water for 15 minutes
- Treat for frostbite if necessary, by gently warming affected area. Seek medical assistance if irritation is present
- In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Seek medical assistance
- Wash contaminated clothing before reuse



# Safety Data Sheet

## SECTION 1. IDENTIFICATION

Product identifier: FK-5-1-12 (Fire Extinguishing Agent)  
Trade Name/Synonym: 3M™ Novac™ 1230 Fire Protection Fluid  
Product identification numbers: 98-0212-3203-2, 98-0212-3217-2, 98-0212-3414-5  
Intended Use: Streaming and flooding fire extinguishing agent

Manufacturer/Supplier: Fireboy-Xintex Fireboy-Xintex UK Operations Limited  
O-379 Lake Michigan Dr. Unit 10 Holton, Holton Ind. Estates  
Grand Rapids, MI 49534 Poole Dorset BH16 6LT UK  
1-616-735-9380 44 (0) 845 389 9462

## SECTION 2. HAZARDS IDENTIFICATION

OSHA/HCS status: This material is considered hazardous by OSHA Hazard Communication Standard (29 CFR 1910.1200)

Classification of substance or mixture: Gases under Pressure

GHS label elements:

Hazard Pictograms:



Signal word: Warning

Hazard statements: H280: Contains gas under pressure; may explode if heated  
P210: Keep away from heat/spark/open flame. – No smoking  
P233: Keep container tightly closed in a cool/well-ventilated place  
P260: Do not breathe dust/fumes/gas/vapors/spray  
P273: Avoid release to the environment  
P280: Wear protective gloves/protective clothing/eye protection/face protection  
P403: Use and store only in a well-ventilated area  
Other Hazards: May cause frostbite  
May displace oxygen and cause rapid suffocation  
Overheating and over pressurizing may cause gas release or violent cylinder bursting

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
1,1,1,2,2,4,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	756-13-8	99.5%

#### SECTION 4: FIRST AID MEASURES

Inhalation:	Remove person to fresh air. If you are concerned, get medical advice.
Skin Contact:	Wash with soap and water. If signs/symptoms develop, get medical attention.
Eye Contact:	Flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. If signs/symptoms persist, get medical attention.
If Swallowed:	Rinse mouth. If you feel unwell, get medical attention.

#### SECTION 5. FIRE FIGHTING MEASURES

Suitable extinguishing media: Product is a fire-extinguishing agent. Material will not burn. Use a fire fighting agent suitable for the surrounding fire.

Special hazards arising from the substance or mixture: Exposure to extreme heat can give rise to thermal decomposition.

Hazardous Decomposition or By-Products:

<u>Substance</u>	<u>Condition</u>
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Hydrogen Fluoride	During Combustion
Toxic Vapor, Gas, Particulate	During Combustion

Special protective actions for fire-fighters: When firefighting conditions are severe and total thermal decomposition of the product is possible, wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

#### SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate area.

Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice.

Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

Environmental precautions: Avoid release to the environment. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water.

Methods and material for containment and cleaning up: Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Seal the container. Dispose of collected material as soon as possible.

## SECTION 7. HANDLING AND STORAGE

Handling: For industrial or professional use only. Contents may be under pressure, open carefully. Do not breathe thermal decomposition products. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment.

Storage: Protect from sunlight. Do not store in temperature above 130°F (54°C). Store away from strong bases. Store away from amines.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: Provide appropriate local exhaust when product is heated. For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use with appropriate local exhaust ventilation sufficient to maintain levels of thermal decomposition products below their exposure guidelines. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

Eye/face protection: Eye protection not required.

Skin/hand protection: No protective gloves required

Respiratory protection: Use a positive pressure supplied-air respirator if there is a potential for over exposure from an uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection. If thermal degradation products are expected, use a full face piece supplied-air respirator.

Exposure limits: Not established.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Liquid
Odor, Color, Grade:	Clear, colorless, low odor.
General Physical Form:	Liquid
Auto ignition temperature:	<i>Not Applicable</i>
Flash Point:	No flash point
Flammable Limits (LEL):	None detected
Flammable Limits (UEL):	None detected
Boiling Point:	49°C [@ 760 mmHg]
Vapor Density:	11.6 [ <i>Ref Std: AIR=1</i> ]
Vapor Pressure:	40.4kPa [@ 25 °C]
Specific Gravity:	1.6 [ <i>Ref Std: WATER=1</i> ]
pH:	<i>Not Applicable</i>
Melting point:	-108°C
Solubility in Water:	Nil
Evaporation rate:	> 1 [ <i>Ref Std: BUOAC=1</i> ]
Volatile Organic Compounds:	1600g/l [ <i>Test Method: calculated SCAQMD rule 443.1</i> ]
Kow - Oct/Water partition coef:	<i>Not Applicable</i>
Percent volatile:	100%
VOC less H2O & Exempt Solvents:	1600g/l [ <i>Test Method: calculated SCAQMD rule 443.1</i> ]
Viscosity:	0.6 centipoise [@ 25°C]

## SECTION 10. STABILITY AND REACTIVITY

Chemical stability:	Stable
Conditions to avoid:	Light
Materials to avoid:	Strong bases, Amines, Alcohols
Hazardous Polymerization:	Hazardous polymerization will not occur.
Hazardous Decomposition or By-Products:	

<u>Substance</u>	<u>Condition</u>
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Hydrogen Fluoride	During Combustion
Toxic Vapor, Gas, Particulate	During Combustion

## SECTION 11. TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the SDS for Toxicological Information on this material and/or its components.

## SECTION 12. ECOLOGICAL INFORMATION

<u>Test Organism</u>	<u>Test Type</u>	<u>Result</u>
Green algae, Selenastrum capricornutum	72 hrs Effect Conc. 50%	7.7mg/l
Zebra Fish, Brachydanio rerio	96 hrs Lethal Conc. 50%	>1200mg/l
Water flea, Daphnia magna	48 hours Effect Concentration 50%	>1200mg/l
Green algae, Selenastrum capricornutum	72 hours No obs Effect Conc	1.2mg/l

Please contact the address listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information: Not determined

Photolytic half-life: 3-5 days

Photolytic degradation products may include Trifluoroacetic acid (TFA)

NOTE: Hydrolysis is not expected to be a significant degradation pathway. Product is highly insoluble in water and volatile, and use as a clean extinguishing agent would not typically result in releases to aquatic environments.

## SECTION 13. DISPOSAL CONSIDERATIONS

Dispose of contents/container in accordance with the local/regional/national/international regulations.

Dispose of waste product in a permitted industrial waste facility. As a disposal alternative, incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include HF. Facility must be capable of handling halogenated materials. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): Not regulated

SECTION 14. TRANSPORT INFORMATION

ID Number(s): 98-0212-3031-7, 98-0212-3201-6, 98-0212-3203-2, 98-0212-3217-2, 98-0212-3371-7, 98-0212-3414-5, 98-0212-3588-6

FK-5-1-12 Extinguishing Agent by itself is not regulated by DOT

Or – If packaged as a charged Fire Extinguisher...

DOT	UN number:	1044
	Proper shipping name:	Fire Extinguishers
	Class:	2.2 (Non-Flammable Gas)
	Labelling No. :	2.2
IATA_C	UN number:	1044
	Proper shipping name:	Fire Extinguishers
	Class:	2.2 (Non-Flammable Gas)
	Labelling No. :	2.2
IMDG	UN number:	1044
	Proper shipping name:	Fire Extinguishers
	Class:	2.2 (Non-Flammable Gas)
Labelling No. :		2.2

SECTION 15. REGULATORY INFORMATION

US federal regulations: Contact Fireboy-Xintex for more information.

311/312 Hazard Categories: Fire Hazard – No                      Pressure Hazard – No,  
 Reactivity Hazard – No                      Immediate Hazard – No  
 Delayed Hazard - No

State regulations: Contact Fireboy-Xintex for more information.

Chemical inventories:

The components of this product are in compliance with the new substance notification requirements of CEPA.

The components of this material are in compliance with the China "Measures on Environmental Management of New Chemical Substance". Certain restrictions may apply. Contact the selling division for additional information.

The components of this material are in compliance with the provisions of the Korean Toxic Chemical Control Law. Certain restrictions may apply. Contact the selling division for additional information.

The components of this material are in compliance with the provisions of Japan Chemical Substance Control Law. Certain restrictions may apply. Contact the selling division for additional information.

The components of this material are in compliance with the provisions of Philippines RA 6969 requirements. Certain restrictions may apply. Contact the selling division for additional information.

The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact Fireboy-Xintex for more information.

International regulations: Contact Fireboy-Xintex for more information.

Additional information: U.S. EPA. Significant New Alternatives Policy Program (SNAP) approved for uses is streaming and flooding fire protection application. This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

## SECTION 16. OTHER INFORMATION

NFPA Hazard Classification:

Health: 3                      Flammability: 0                      Reactivity: 1                      Special Hazards: None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification:

Health: 0                      Flammability: 0                      Reactivity: 1                      Protection: X - See PPE section

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Revision: March 25, 2020

March 05, 2021

October 07, 2021

### Returning Fireboy-Xintex Equipment

No product may be returned for credit or repair without a written "Returned Material Authorization" (RMA) form. Purchaser must call or email Fireboy-Xintex 616-735-9380 or [fireboy@fireboy-xintex.com](mailto:fireboy@fireboy-xintex.com) for an RMA. For international customers, call or email Fireboy-Xintex UK Operations Limited +44 (0) 845 389 9462 or [fireboyeu@fireboy-xintex.com](mailto:fireboyeu@fireboy-xintex.com). If due to extenuating circumstances a product is to be returned, after approval it must be received in 100% new/resalable condition. Products stored by the buyer for more than 26 weeks may not be returned for any reason. Maintaining fresh and current inventory is the responsibility of the buyer.

### Recharging Fireboy Extinguishers

Fireboy-Xintex cylinders comply with DOT specification 4B/240, 4B/360, and 4BW/360 which allows for recharging if the extinguisher was not discharged due to a fire and passes visual inspection in accordance with CUA C-6, or a hydrostatic test. Extinguisher cannot be recharged or refilled in the field. Contact manufacturer for details on the recharging process.

## 3 Year Limited Warranty

This Warranty is in lieu of all other expressed or implied Warranties

Seller warrants title, materials, and workmanship on equipment, except components manufactured by others for which the Seller assigns, as permitted, the original manufacturer's warranty. Seller's warranty shall be for a period of (3) three years from the date of sale to the ORIGINAL CONSUMER PURCHASER, during which non-conforming equipment returned to the Seller at Buyer's expense and risk, be repaired or replaced at the Seller's option. Fireboy-Xintex will repair or replace products found to be defective in materials or workmanship within the period set forth above, provided that: (a) the product has not been subjected to abuse, contamination, neglect, accident, incorrect wiring not our own, improper installation or servicing, or used in violation of instructions furnished by Fireboy-Xintex and (b) as to any prior defects in materials or workmanship covered by this warranty, the product has not been repaired or altered by anyone except Fireboy-Xintex and (c) the serial number has not been removed, defaced or otherwise changed, and (d) examination discloses, in the judgment of Fireboy-Xintex, does not assume the costs of removal and/or installation of the product or any other incidental costs of removal and/or installation of the product or any other incidental costs which may arise as a result of any defect in material or workmanship, and (e) upon discovery of defect, Buyer shall immediately cease use of and notify Fireboy-Xintex.

Any warranty implied by law, including warranties of merchantability or fitness, is in effect only for the duration of the expressed warranties set forth above, no person is authorized to give any other warranty, or to assume for Fireboy-Xintex any other liability in connection with the sale of its products; Fireboy-Xintex shall not be liable for the loss of use, revenue, or profit or for any injury, or for any other consequential or incidental damages, buyer is not relying on seller's judgment regarding his or her particular requirements, and has had an opportunity to inspect the product to his or her satisfaction.

This warranty gives you specific legal rights, and you may also have other rights, which vary, from location to location.

Contact information listed below. For US customers, contact Fireboy-Xintex. For international customers, contact Fireboy-Xintex UK Operations Limited.

[www.fireboy-xintex.com](http://www.fireboy-xintex.com)

USSC Acquisition Corp  
(d/b/a Fireboy-Xintex)  
O-379 Lake Michigan Dr. NW  
Grand Rapids, MI 49534  
fireboy@fireboy-xintex.com  
Phone (616) 735 9380

Fireboy-Xintex UK Operations Limited  
10 Holton Road, Holton Heath Trading Park  
Poole Dorset BH16 6LT UK  
fireboyeu@fireboy-xintex.com  
Phone +44 (0) 845 389 9462