Stat-X® Aerosol Fire Suppression

Thermal, Manual, Thermal/Manual Generator

Owner's Manual

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Fireaway Inc. 5852 Baker Road • Minnetonka,MN 55345

INTRODUCTION

Thank you for your purchase of a Stat-X® aerosol fire suppression generator. This brief manual is designed to provide you with a general understanding of the product, as well as, general information on installation, operational, and maintenance parameters. **It is not a detailed design, installation, operation, and maintenance manual.** A detailed manual may be obtained by contacting the manufacturer:

Fireaway Inc.
5852 Baker Road
Minnetonka, MN 55345
U.S.A.
www.statx.com

Stat-X systems are to be designed, installed, and periodically inspected by trained personnel only.
No modifications are to be made to the installed system without consulting a qualified system designer. A system is made up of units tested within limitations contained in the detailed design, installation, operation, and maintenance manual. The system designer must be consulted whenever changes are planned for the system or the protected area. An authorized installer or system designer must be consulted after the system has discharged.

SYSTEM DESCRIPTION

General

Stat-X thermal/manual operated units combine an environmentally safe fire suppression agent, specially developed components, and a thermal detection device to provide rapid agent application. The resulting timely suppression of fire may reduce property, facility, and equipment damage. These units are compact and may eliminate the need for expensive pressure vessels, nozzles, and distribution piping associated with other fire suppression systems. The thermally activated generator (with manual release override or manual operation) is strategically placed within the protected enclosure offering significant space savings over conventional systems.

Stat-X thermal units are designed for total flooding applications in accordance with established design criteria. All installations must meet the requirements of the local authority having jurisdiction.

A single thermal/manual operated unit is used to suppress Class A (surface), Class B, and Class C fires in specific hazard areas, facilities, or within equipment located in enclosed areas and confined spaces where low weight/space to extinguishing capacity is a factor.

Stat-X thermal/manual operated units are used to suppress fires in enclosures where an electrically non-conductive agent is required and where low weight/space to extinguishing capacity is a factor. The fire-extinguishing agent is an ultra-fine aerosol, which hangs in suspension for extended periods of time (up to one hour) providing protection against re-flash and clean up.

Stat-X systems are **not suitable** for the following hazards; or, where the following materials may be present:

- Materials, which burn with deep-seated characteristics (wood, fiber, cotton, etc.)
- Electrical equipment operating at over 40,000 V
- Metal hydrides, pyrophoric substances, and chemical substances that smolder and burn without air
- Metal powders (magnesium, titanium, etc.)
- Environments which require devices specifically listed/labeled for installation inside hazardous areas

Extinguishing Agent

The aerosol produced upon activation of the Stat-X generator suppresses fire by a combination of chemical and physical mechanisms similar to Halons without a negative effect on the environment. Because of the aerosol's ultra-fine particle size (≤ 2 micron) there is a dramatic increase in the surface area interaction between the agent and the fire.

Unlike gaseous agents, the aerosol does not decompose in the presence of fire nor does it extinguish by oxygen deprivation. The aerosol is considered non-toxic to humans when applied in normal design concentrations necessary to extinguish most fires; however, certain safety restrictions should be observed when applying and handling the generators. Exposure to the aerosol should be limited and unnecessary exposure to the particulate should be avoided. Exposure to the aerosol is generally of less concern than exposure to the decomposition products of a fire.

Toxicity: Tests conducted by Charles River Laboratories (Tranent, Scotland) as well as others have shown that the aerosol does not present a health hazard due to limited accidental exposure at normal design concentrations. Exposures under five minutes are normally considered safe. While the components of the aerosol are not considered toxic at normal concentration levels, ingestion of the ultra-fine particulate may cause short-term discomfort and unnecessary exposure should be avoided. Tests have shown no long-term negative effects from exposure to the aerosol. In addition, the aerosol has a high obscuration factor. US EPA has approved Stat-X for use as a total flooding system for normally occupied spaces.

Stat-X is US EPA SNAP listed for use in normally occupied and unoccupied areas.

Residue and Cleaning: The ultra-fine aerosol discharge remains in suspension for an extended period and can be vented by a fan or air handling system. Aerosol residue, which may have settled on the floor, equipment, or other surfaces, can be vacuumed or wiped clean with a water & acetic acid solution (e.g. vinegar). Settled and agglomerated particulates following an aerosol discharge is initially deliquescent in spaces with high humidity and is soluble in water.

Operating/Temperature Range: Stat-X thermal manual units are approved to operate within a temperature range of -40°C to +54°C. Generators are sealed with a non-permeable membrane and are unaffected by fluctuations in humidity and temperature. Accelerated aging tests have shown the generator's charge maintains its viability for more than 15 years under conditions ranging from -40°F (-40ºC) to +130°F (+54ºC) and cycled relative humidity levels up to 95%.

Generator Housing Clearance

Generators must never be installed to discharge directly on walls or equipment being protected, as this will cause agglomeration of the aerosol in the vicinity.

Model	Clearance from Combustible Materials	
30T	7	0.25
60T	7	0.25
100T	13	0.50
250T	13	0.50
250MT	13	0.50
500T	13	0.50
1000MT	13	0.50

Other Safety Considerations: The aerosol discharged into the hazard area upon activation of the generator is relatively "cool." **However, the aerosol stream as it leaves the generator may be above 100°C** for a short distance from the outlet of the generator. Maximum temperatures are realized only in the last seconds of discharge. Each model has a required installation clearance distance specified as its "C-Zone" (see page 4). Steps must be taken to ensure generator placement complies with this installation requirement. The generator housing is **approximately 90°C immediately after discharge** and care should be taken if handling the post-discharge generator prior to its cooling to ambient temperature.

INSTALLATION

Facility Considerations

General. Stat-X generators must be installed to facilitate proper operation, inspection, testing, and any other maintenance as may be necessary. Equipment must not be subject to mechanical, chemical, or other damage, which could render the equipment inoperative or ineffective. Equipment must be installed in accordance with all applicable regulations, standards and the contents of the manual.

Significant Obstructions/Agent Distribution: In cases where there is a large ratio of fixed equipment to total volume, or where the protected equipment is located in such a way as to present a barrier to the free flow and distribution of aerosol throughout the hazard area, the use of a larger number of smaller aerosol generators may be more suitable. This will allow for strategic placement of the aerosol generators and improved distribution characteristics throughout the protected area.

WARNING

AEROSOL GENERATORS CONTAIN A FLAMMABLE SOLID ELEMENT AND MUST ONLY BE HANDLED, INSTALLED, AND SERVICED BY A TRAINED TECHNICIAN USING THE INSTRUCTIONS CONTAINED IN THIS SECTION. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD CAUSE A PREMATURE DISCHARGE, INEFFECTIVE DISCHARGE, AND/OR POTENTIAL INJURY.

Mounting: Stat-X aerosol generators are listed for both sidewall and ceiling locations and may be mounted on walls, beams, constructions, and columns, as long as the unit is securely bolted to the support structure and is mounted in a position where its “C-zone” (clearance zone where momentary peak temperature of the discharge will not exceed 75°C) will not impact on personnel, facilities, equipment or combustible materials located within the protected area. Housing clearance is required spacing of generator from combustibles and structural materials.

Installation Requirements – Thermal Operated Units

Model	C-Zone	Height Max.	Max. Area	Required Clearance from Combustible and Structural Materials
30T	0.25 m	1.0 m	0.50 m^2	7 mm
60T	0.30 m	1.8 m	0.60 m^2	7 mm
100T	0.46 m	1.8 m	0.92 m^2	13 mm
250T	0.95 m	2.0 m	2.13 m^2	13 mm
250MT	0.95 m	2.0 m	2.13 m^2	13 mm
500T	1.27 m	2.5 m	3.72 m^2	13 mm
1000MT	1.70 m	3.0 m	5.33 m^2	13 mm

Installation Requirements – Manual Operated Units

Model	C-Zone	Height Max.	Max. Area	Required Clearance from Combustible and Structural Materials
30T	0.25 m	1.8 m	1.44 m^2	7 mm
60T	0.30 m	2.5 m	2.89 m^2	7 mm
100T	0.46 m	2.5 m	4.75 m^2	13 mm
250T	0.95 m	3.50 m	11.9 m^2	13 mm
250MT	0.95 m	3.50 m	11.9 m^2	13 mm
500T	1.27 m	4.00 m	23.8 m^2	13 mm
1000MT	1.70 m	4.88 m	23.8 m^2	13 mm

Mounting Height: In general, the aerosol generators should be mounted at or near ceiling height and angled toward the floor at an angle to ensure three-dimensional distribution of aerosol and an unobstructed discharge path. (15° - 30° for sidewall mounting). To ensure maximum distribution of aerosol throughout the hazard area, the maximum height of generator placement from the floor must be limited as indicated above. Underfloor applications should be mounted horizontally.

Flow: Placement of the aerosol generators to ensure proper aerosol flow and distribution is extremely important as each generator functions as a flow nozzle. **Aerosol generators must never be positioned to discharge directly at each other!** This will cause agglomeration of the aerosol particulate, reducing the aerosol's extinguishing effectiveness. **For the same reason, aerosol generators must be positioned to ensure that the aerosol stream does not impinge directly on walls or the sides of equipment being protected.**

Aerosol Generator Installation. Stat-X thermal operated aerosol generators must be located **within** the protected enclosure. The following installation instructions must be followed in the exact sequence outlined below to prevent accidental discharge, bodily injury, or property damage.

NOTE: THERMALLY OPERATED MODELS ARE TO BE INSTALLED AS A SINGLE UNIT SYSTEM ONLY. MANUAL OPERATED SYSTEMS MAY USE UP TO A MAXIMUM OF FOUR (4) UNITS.

1. Position mounting bracket and securely fasten in a location and manner to allow for an unimpeded discharge upon activation, and which ensures the generator will not be subjected to accidental damage or movement.

Care must be taken so that the generator does not directly discharge at close range at the wall, ceiling, or vertical surfaces of the equipment within the hazard area.

2. The unit should be mounted as close as possible to ceiling height in an area that will be exposed to turbulent airflow in the event of a fire and angled to discharge down toward the floor to ensure three-dimensional distribution of aerosol. Potential "dead air" locations should be avoided. In unvented enclosures avoid mounting in a corner as this may become an area of dead air flow.

3. Remove generator from shipping container and inspect integrity of the non-permeable membrane and generator. Do not install if the membrane is ruptured in any way or if the housing has been damaged in shipment.

4. Securely attach generator to the mounting bracket, taking care to ensure that there is adequate room for the detector mechanism and that all bolts are securely tightened in place.

5. Remove shipping caps from both the generator and the thermal detector or manual only release head (supplied separately).

6. Install the thermal detector or manual only release head into the bushing on the top of the generator taking care not to damage the threads. The detector will "bottom" into the bushing when properly installed hand tight.

Additional Steps When Connecting To Manual Release Cotter Pin:

7. Manual release cable pull systems include a cable with T-handle and wall/panel bulkhead mounting hardware.

8. Run pull cable along enclosure wall in the shortest path possible to the generator while taking care to respect the maintenance envelopes of equipment inside the enclosure. The number of cable bends should be minimized as these increase pull force. The minimum cable bend radius must also be respected to avoid jamming or increasing the friction of the internal sliding cable rope core. Anchor the pull cable on the enclosure wall with suitable cable tie mounts at regularly spaced intervals such that the pull cable jacket is firmly immoveable. Cable tie mounts must be suitable for permanent mounting on the enclosure surface. Typical mounts are of the adhesive backed type if surface is painted or screw mount type if adhesives are not suitable.

9. Loop (if possible) excess cable length while respecting the bend radius. This will allow additional cable length to be available to remove the permanently crimped cable eye terminal sleeve from the manual release actuator cotter pin should it be necessary to remove the generator for servicing or replacement.

10. Measure pull cable core length to cotter pin at the manual actuator, and cut cable core to length, keeping into consideration the location of the closest cable tie mount.

It is important that the free end of the pull cable outer jacket is firmly anchored and immoveable relative to the manual actuator on the generator. The only moving parts should be the steel cable core sliding inside the cable jacket and the cotter pin on the actuator.

11. Strip the cable jacket and expose approximately two (2) inches of cable core (or the travel length necessary to pull the cotter pin completely from the manual actuator). Carefully insert the exposed cable core through the cotter pin on the actuator, form a tight loop, insert the core into the cable sleeve, and firmly crimp the sleeve to form a pull cable eye terminal. Ensure that the axis of the cable core and cable jacket is aligned with the pull direction of the cotter pin.

NOTE: DURING CABLE PULL RELEASE INSTALLATION, EXTRA CARE SHOULD BE EXERCISED NOT TO PULL OUT THE MANUAL ACTUATOR RELEASE COTTER PIN FROM ACTUATOR. THIS WILL CAUSE THE GENERATOR TO ACTIVATE. PULL FORCE IS LOW FOR A SINGLE GENERATOR INSTALLATION. SOME INSTALLERS PREFER THE USE OF A CARABINER SNAP HOOK BETWEEN THE ACTUATOR COTTER PIN AND THE PULL CABLE EYE.

12. Tie the cable jacket to the last cable tie mount closest to the manual actuator ensuring that the cable pull direction is aligned with the cotter pin, and that the cable pull jacket is firmly immoveable at the terminal end. The cotter pin should be under tension when crimped to the pull cable and pull cable eye terminal should not “dangle” loose when fitted to the cotter pin.

13. The cable pull assembly at the manual actuator should be installed such that the exposed cable core (or cable jacket) will not be struck, pulled, or pushed in a manner that can cause the cotter pin to be pulled from the manual actuator head. The final cable tie mount should be located as close as possible to the manual actuator.

Post Installation Checkout: After the Stat-X generators have been installed perform the following inspection and tests:

1. Verify generator(s) is the correct size and installed per the installation drawings.

2. Verify generator(s) mounting bracket is properly installed and that all fittings are tight.

3. Verify generator(s) is positioned properly; check for obstructions in the path of the aerosol discharge stream.

4. Generator(s) must be installed such that they cannot cause personnel injury upon activation.

5. All acceptance testing shall be in accordance with any applicable standards and the authority having jurisdiction.

OPERATION

Aerosol Generator. A solid charge of the aerosol composition is contained within the sealed generator. Upon activation of the initiator, the charge begins a controlled burn producing an ultra-fine aerosol. The aerosol passes through a cooling bed where the temperature of the aerosol is rapidly reduced before it escapes through the discharge ports of the generator at low pressure. Generator placement within the hazard area must provide proper flow and distribution of the highly effective aerosol within the protected area.

Thermal Detector. The thermal detector supplied with the aerosol generator is rated to activate at a specified activation temperature. Upon reaching the activation temperature, a small eutectic element within the detector deforms allowing release of a spring-loaded pin which activates the aerosol generator. Detection units are available with varying temperature options. Placement of the unit at the top of the enclosure ensures the fastest possible reaction to heat buildup in the event of a fire.

The detector is best located in an area that will be exposed to turbulent airflow in the event of a fire; (i.e. near a vent opening). In un-vented enclosures avoid mounting in the corner as this may be an area of dead air flow.

WARNING

ENSURE FIRE IS COMPLETELY EXTINGUISHED BEFORE VENTILATING AREA. BEFORE PERFORMING POST FIRE MAINTENANCE PROCEDURES REFER TO THE MATERIAL SAFETY DATA SHEET.

Post Discharge Operation: After discharge of a Stat-X fire suppression generator(s), qualified fire suppression system maintenance personnel must perform maintenance and system verification procedures outlined in this manual.

The following procedures must be followed in the exact sequence to maintain and re-commission a Stat-X suppression system:

1. After discharge, allow a minimum holding time of ten (10) minutes

2. Always be sure to have backup portable extinguishers

at hand for use in the event of re-ignition.

3. Vent the area thoroughly by operating the ventilation system, by fan extraction, or by opening doors and windows. To avoid unwanted inhalation of fire by-products and aerosol, a protective breathing apparatus or mask should be worn if it is necessary to enter prior to complete ventilation of the hazard volume.

4. Inspect the area to ensure the fire is completely extinguished and that there are no localized hot spots or other sources of re-ignition.

5. Remove spent generators, being sure to wear gloves or other hand protection. The generators will remain quite warm for an extended period after discharge.

6. Dispose of spent generators according to applicable federal, state, and local regulations.

7. Contact your authorized Stat-X distributor immediately for replacement generators. Replacement and commissioning should only be undertaken by trained personnel.

8. Refer to the Stat-X post discharge clean-up and system re-commissioning guide, document P/N 19006 for manufacturer clean-up recommendations.

MAINTENANCE

General: To ensure proper operation of your fire suppression system; Stat-X suppression generator(s) require a systematic maintenance program. A periodic maintenance schedule must be instituted including an inspection log updated and maintained for reference. The log should, at a minimum, record the: (1) inspection interval, (2) inspection procedure performed, (3) maintenance performed, if any, as a result of inspection, and (4) name of the person, and company, performing the inspection and/or maintenance.

Preventive Maintenance: Fireaway suggests that a preventive maintenance program require, at a minimum, the following schedule:

Schedule	Requirement
Every 6 Months	Visual inspection of components and generator(s)
	Inspect bracketing and position of generator
	Perform tests of system
Every 15 Years	Replace generator(s) per date code on label

Inspection Procedures Every Six Months

1. Make a general visual inspection of all aerosol generators for damaged or missing parts.

2. Ensure there are no obstacles inhibiting the proper operation of the aerosol generators or distribution of the aerosol in the event of a fire.

3. Test the entire system for functionality and possible faulty components.

Replacement/Removal from Service: The aerosol generators have an installed service life of 15 years.

They are to be replaced 15 years from the Date Code in the lower right corner of the product label. The Date Code appears as follows, the left most 2-digit numeric character represents the year and the numeric series on the right represents the month of shipment from the factory:

18	19	20	21		1	2	3	4	5	6	7	8	9	10	11	12

18 = 2018, 19 = 2019, 20 = 2020, etc. A unit marked 18 12, for example, would have shipped in December 2018.

RECYCLING OF AEROSOL GENERATORS AFTER DISCHARGE:

In most cases the discharged generator can be disposed of in any landfill that handles industrial waste. However, local regulations must be researched and observed. Each discharged aerosol generator will contain the following material:

1. Stainless steel outer shell – all

2. Mild steel cross members/spacers - all

3. Stainless steel inner shell – 100, 250, 500

4. Mild steel inner shell – 30, 60

5. Stainless steel top and bottom plates, screens – all

6. Activated Alumina: CAS 1333-84-2 (Aluminum Oxide non-fibrous)

30T	60T	100T	250T	250MT	500T	1000MT
20g	40g	100g	550g	197g	970g	1.317g

7. Fiberglass rope (ø1cm x 50cm) – 250, 500.

8. Ceramic Paper < 15g – 30, 60, 100

9. Trace Chemicals: K2CO3 (water-soluble particulate "trapped" in unit during discharge).

Contact your authorized distributor or Fireaway if there are any questions relative to the above.

LIMITED WARRANTY STATEMENT

Fireaway represents that this product is free from defects in material and workmanship, and it will repair or replace any product or part thereof which proves to be defective in workmanship or material for a period of eighteen (18) months from the date of shipment from our factory. Defective units should be returned to the factory.

Fireaway will repair, or replace, any units determined to be defective and return such units shipping prepaid. Return or repair shall be the purchaser's sole remedy for defect.

Limitations of Liability

This warranty does not cover equipment damaged during shipment or by misuse, accident, or negligence, or which has been repaired or altered by others. Fireaway shall not under any circumstances be liable for special or consequential damages such as, but not limited to, damage or loss of property or equipment, loss of profits or revenue, cost of capital, cost of purchased or replacement goods, or claims by customers of the original purchaser. Remedies set forth herein to the original purchaser and all others shall not exceed the price of the equipment supplied.

This warranty is exclusively and expressly in lieu of all other warranties, whether expressed or implied, including warranty of merchantability or fitness.

A DETAILED MANUAL MAY BE OBTAINED BY CONTACTING THE MANUFACTURER.

Questions concerning the information presented in this manual may be addressed to your authorized distributor or:

Fireaway Inc. 5852 Baker Road, Minnetonka, MN 55345, U.S.A.

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