NYC Department of Buildings
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Report of Materials and Equipment Acceptance Division

Pursuant to Administrative Code Section 27-131, the following equipment or material has been found acceptable for use subject to the terms and conditions contained herein.

MEA 28-99-E Vol. 5

Manufacturer:	Marioff, Inc. 6111-M NB Hammonds Ferry Road Linthicum, MD 21090
Trade Name(s):	HI-FOG
Product:	Water Mist Fire Protection System
Pertinent Code Section(s):	Reference Standard RS-17 and Subchapter 17
Test(s):	FMRC Fire Performance Class 5560
Laboratory:	Factory Mutual Research 1151 Boston Providence Turnpike. P.O. Box 9102, Norwood, MA. 02062
Test Report(s):	Approval Report: Factory Mutual Report Project ID 3022984, Class 5560, reissued date August 10, 2005, supersedes Report dated July 18, 2005.

Description: The HI-FOG 2000 Sprinkler Pump Unit (SPU) water mist fire protection system is for the protection of light hazard occupancies. This SPU water mist system supplies high-pressure water as part of a water mist fire suppression system. The water is delivered through a pipe network to a high-pressure nozzle to produce a fog, or mist of small water droplets. When activated by a reduction in system pressure or by a remote or local start signal, the pump system controllers initiate the starting sequence of the pump motors. The pump system consists of the following major components:

- From 2 to 6 pump modules
- From 2 to 6 pump controllers
- A programmable logic controller
- A water tank
- An inlet water filter
- A pneumatic stand-by pressure pump

Each pump module is made up of an electric motor and two piston style positive displacement pumps. A pump system may consist of from 2 to 6 modules. There are two pump sizes (40.6 L/min and 48.7 L/min) and three electric motor sizes (15.5, 22.0, and 27.0 kW) that can be used in specific combinations to achieve the desired flow and pressure for the water mist system it supplies. Each pump has a dedicated relief valve that is adjusted and set during system commissioning. The relief valve set point determines the maximum pressure that can be supplied to the system piping. The correct set pressure is unique to each water mist system installation and is determined by system hydraulic calculations. Typical pressure settings for this system are between 80 and 140 bars (1160 and 2030 psi).

A Cutler-Hammer programmable logic controller (PLC) manufactured by Mitsubishi, is housed in a controller cabinet. The PLC receives inputs from the pressure transducers, flow meter and discharge valve position switch on the SPU. The PLC coordinates the starting and shutdown sequence of the motors along with system monitoring and alarm functions. The automatic shutdown sequence is defeatable if manual only shutdown is required.

The water is stored in a 330, 545 or 555 liter (87,144 or 146 gallon) tank at atmospheric pressure. The water tank sizes correspond to the SPU 1 and 2, SPU3, SPU 4, 5 and 6 applications, respectively. The water tank shall be connected to a suitable pressurized water source. An automatic water inlet control valve is controlled by a float switch in the tank. During operation, the loss of the water in the tank is automatically replenished by the water inlet control valve.

The water inlet is provided with a high-capacity water filter.

A small pneumatic stand-by pressure pump is used to maintain the pressure in closed head water mist systems at 25 bar (360 psi). This pump requires an outside source of compressed air to operate.

Pursuant to "Promulgation of the Rules relating to Material and Equipment Application Procedures" dated November 5, 1992, the Bureau of Fire Prevention has no objections (letter dated June 28, 2008, F.P. Index #0806011).

Terms and Conditions: This Marioff HI-FOG 2000 water mist system with a SPU positive displacement pump unit is accepted on condition that:

1. Installation of the system shall be in accordance with the New York City Building Code, Chapter 9 (Fire Protection Systems) and shall not be installed in lieu of sprinklers, or any other extinguishing system otherwise required by law.

2. The system is approved for the protection of light hazard occupancies as defined in FM Global Property Loss Prevention Data Sheets.

3. The system is only to control a fire by limiting the size of fire so as to decrease the heat release rate and pre-wet adjacent combustibles while controlling ceiling gas temperatures to avoid structural damage.

4. System shall not be used where visibility is a concern.

5. The system shall conform to the requirements of NFPA 750 (2003) “Standard on Water Mist Fire Protection Systems”.

6. The system shall be in compliance with the requirements/conditions/limitations of the Factory Mutual Research Corporation Approval Report (Project ID 3022984) Class 5560 dated July 18, 2005, including the manufacturer’s design, installation, operation and maintenance manual (dated April 2005) Part No. MO/ES/13/DIOM/FM/03 Rev 1.1 and the applicable FM Global Property Loss Prevention Data Sheet.

7. Only water shall be used in the system.

8. The system shall be designed to provide a minimum of thirty minutes of protection (based on a nine nozzle design).

9. The electric-driven pump unit, SPU, shall be located such that the ambient temperature conditions around the unit shall be in the range from 40°F to 130°F.

10. Only the nozzles, Model C10-57C, C11-57C, S10-57C, C20-57C C21-57C and S20-57C high pressure automatic nozzles, in a nickel plated finish, with 135°F bulb type fusible element shall be used. Other system components listed in the Factory Mutual Approval Report (Project ID 3022984), Class 5560 dated July 18, 200 shall be used in the system.

11. All water utilized in this system shall be equivalent to a potable water supply. All water shall be processed through a filter with a minimum mesh size of 100 µm.

12. The system shall be used in manned or monitored facilities only.

13. Installation, testing and maintenance shall be conducted by a licensed master fire suppression piping contractor – Class ‘A’ or Class ‘B’ licensee.

14. High pressure piping shall be clearly identified by means of labeling.

15. Installation shall comply with all applicable New York City codes, rules, regulations and testing requirements.

16. The electric driven pump unit, SPU, shall be located outside of the protected enclosure.

17. Automatic activation of the system shall sound a local alarm and transmit an alarm to an approved central station.

18. Power to the alarm system shall be in accordance with the applicable requirements of the New York City Building Code and the New York City Electrical Code.

19. Provisions shall be made for audible and visible alarms within and outside the location to be protected by the installation to signal the activation of an automatic detection device and subsequent operation of extinguishing system. Such signals shall continue until the atmosphere has been returned to normal.

20. Plans filed with the Department of Buildings for the installation, showing detection equipment, equipment and piping alarm systems, and all other safety features, shall be reviewed and approved by the Bureau of Fire Prevention for each location prior to installation.

21. The applicant shall ensure that the installation has been subjected to a satisfactory inspection and test in the presence of an inspector from the Bureau of Fire Prevention prior to placing the system in operation. Such inspection shall demonstrate the following:

    a. All detection, discharge, alarms and other devices operate satisfactorily,

    b. All piping is clear and unobstructed, and that the piping and attached appurtenances subject to system pressure shall be hydrostatically tested to 150 percent of the normal working pressure, and shall be maintained at that pressure without loss for two hours. Loss shall be determined by drop in gauge pressure or visible leakage.

    c. In addition, a discharge test may be required where, in the opinion of the Bureau of Fire Prevention, such a test is needed to determine whether the system design requirements have been met.

22. Water mist system inspection, testing, maintenance activities, and personnel training shall be implemented in accordance with the relevant sections of Section FC901 and FC904 of the NYC Fire Code and NFPA 750 (2003). The results of inspection, testing, and maintenance conducted firing the previous three years shall be maintained on the premises, and shall be produced upon demand by a Fire Department representative.

23. Each approved system shall bear a metal label permanently affixed indicating the MEA approval number issued by the Material and Equipment Acceptance (MEA) Division of the NYC Department of Building.

Final Acceptance August 4, 2008

Examined By