High Expansion Foam Generators Model Hiex

General Description

HIEX High-Expansion Foam Generators deliver a mass of uniform bubbles in which the foam solution is expanded in volume to a range of 200:1 to approximately 1000:1. This high-expansion foam is achieved by coating a perforated screen with a foam solution comprised of water and METEOR X 2% High-Expansion Foam Concentrate, while a high volume of air is blown on the screen to produce the expanded foam. A continuous supply of METEOR X foam solution to the HIEX generator enables the development of a large volume of foam. The largest HIEX generator will produce 816 m3 per minute of foam at 6.9 bar inlet pressure. All HIEX generators are water-powered and require no other source of power.

Extinguishment mechanisms of METEOR X 2% High-Expansion Foam Concentrate when applied with a HIEX generator involve a combination of the following:

- Free air movement necessary for continued combustion is reduced
- Water content of the foam being converted to steam dilutes the oxygen concentration to a level below that necessary to support combustion
- Cooling to a temperature below the combustion point or auto ignition temperature of Class A or Class B fuels occurs as water is converted to steam
- Reduced surface tension of the foam solution draining from the expanded foam penetrates into Class A materials extinguishing deep seated fires
- Insulating and heat reflective properties of the foam blanket provide a heat shield preventing fire spread

Benefits

- Minimal water damage is caused to the structure or its contents
- Due to the high-expansion ratios, little water is required to generate large quantities of expanded foam
- Because of its extremely low water content, high-expansion foam can be used in and around many types of electrical equipment (see note)
- The potential for hazardous run-off is reduced as compared to sprinkler systems requiring a large volume of water

HIEX-27

Product Features

- Reliable, Water Motor Powered
- Foam Capacities up to 816 m^3/min
- Operating pressure and tests from 2.8 up to 6.9 bars
- All Models UL Listed
- All Models CE Marked

Applications

Depending on the type of hazard and its configuration, a HIEX High Expansion Foam System may be designed for total flooding or local application. Common applications suited for high-expansion foam include:

- Aircraft Hangars
- Hazardous Waste Storage
- Paper Product Warehouse
- Tyre Warehouses
- Flammable Liquid Storage
- Mining
- Ship Holds and Engine Rooms
- Power Stations
- Gas Turbine Generators
- Cable Tunnels
- Engine Test Cells
- Transformer Rooms
- Basements, Cellars and Enclosed Spaces
- Communications Switching Stations

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In addition to the above hazard types involving Class A and B fires, high-expansion foam is effective in controlling Liquefied Natural Gas (LNG) fires by blocking heat feedback from the flames to the LNG thereby reducing the vaporization rate. High-expansion foam is also effective in reducing vapour concentrations downwind from un-ignited LNG and other hazardous low-boiling-point gaseous products such as ammonia spills.

Listings and Approvals

High-expansion foam systems are designed in accordance with NFPA 11 Standard for "Low, Medium and High-Expansion Foam Systems," which requires that the high-expansion generator(s) be listed or approved together with the type of high-expansion foam concentrate used.

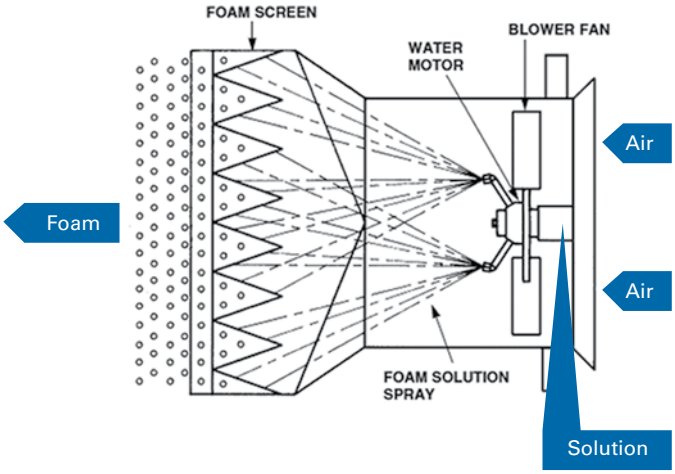
- UL Listed
- CE marked

Ordering Information

Part No.	Description
■ 438482	HIEX-5A
■ 438483	HIEX-15A
■ 438484	HIEX-15A LNG
■ 438487	HIEX-27
Stainless Steel*	
■ 438489	HIEX-5A SS version
■ 438490	HIEX-15A SS version
■ 438491	HIEX-15A LNG SS version

* Stainless Steel Housing and Motor Brackets

Generator Component Information



Typical HIEX Generator with Meteor X 2% System Calculation (Total Flooding)

BUILDING TO BE PROTECTED IS:

- Light steel construction
- Not sprinklered

HAZARD:

- Low density combustibles

FILL TIME:

As stated in NFPA 11, the fill time for a non-sprinklered building of light steel construction and a hazard of low density combustibles is a maximum of 3 minutes (T).

AREA OF BUILDING:

- 31 m x 9 m = 279 m^2
- Height of building 4 m = Volume (V) of 1116 m^3 (279 m^2 x 4 m)

CALCULATION WITHOUT SPRINKLERS

R = (V / T) x Cn x CL

R = Rate of Discharge (cmm)

V = Submergence Volume (cubic meters)

T = Submergence Time (minutes)

CN = Compensation for normal shrinkage
(1.15 constant)

CL = Compensation for leakage
(1.0 no leakage)
(1.2 moderate leakage)

R = (1116 m^3/3 min) x 1.15 x 1

= 372 x 1.15 x 1

= 428 cubic meters per minute (cmm) required
428 m^3/min / 266 m^3/min per HIEX-5A
@ 5.2 bar generator = 1.61 generators

Therefore, use two HIEX-5A generators at 266 m^3/min each (see Table 2 for options)

Typical HIEX Generator with Meteor X 2% System Calculation (Total Application)

GROUP II AIRCRAFT HANGAR (USING INSIDE AIR TO GENERATORS) HANGAR TO BE PROTECTED IS:

- Group II hangar measuring 3082 m^2
- Sprinkler system (wet pipe) for 6.9 L/min/m^2 over 465 m^2

FILL TIME:

As stated in NFPA 409, fill depth of 0.9 m (3 ft) within one minute (T) with sufficient foam concentrate for 12 minutes total

VOLUME OF FOAM (V):

- 3082 m^2 x 0.9 m = 2818 m^3

CALCULATION WITH SPRINKLERS

R = ([V / T] + RS) x CN x CA

RS = Rate of foam breakdown by sprinklers 0.075 m^3/min/ L/min x sprinkler system discharge in L/min

CN = Compensation for normal shrinkage
(1.15 constant)

CA = Compensation for inside air
(1.20 constant – test criteria)

CL = Leakage factor not required for local application system

R = ([2818 m^3/1 min] + 241 m^3/min) x 1.15 x 1.2

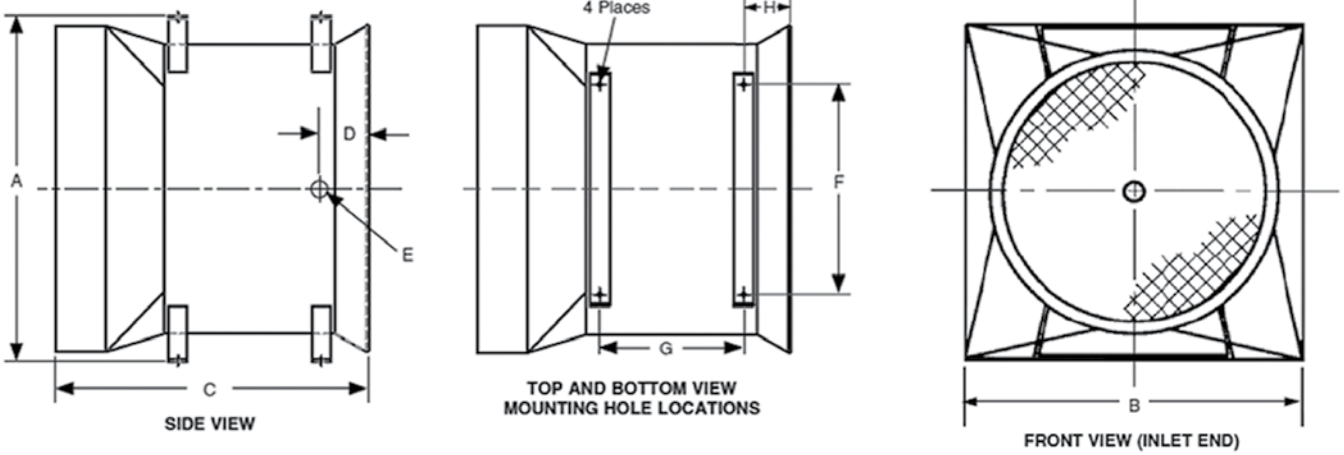
= 3059 x 1.15 x 1.2

= 4221 m^3/min minimum required
4221 m^3/min / 773 m^3/min per HIEX-27
@ 5.2 bar = 5.46 generators

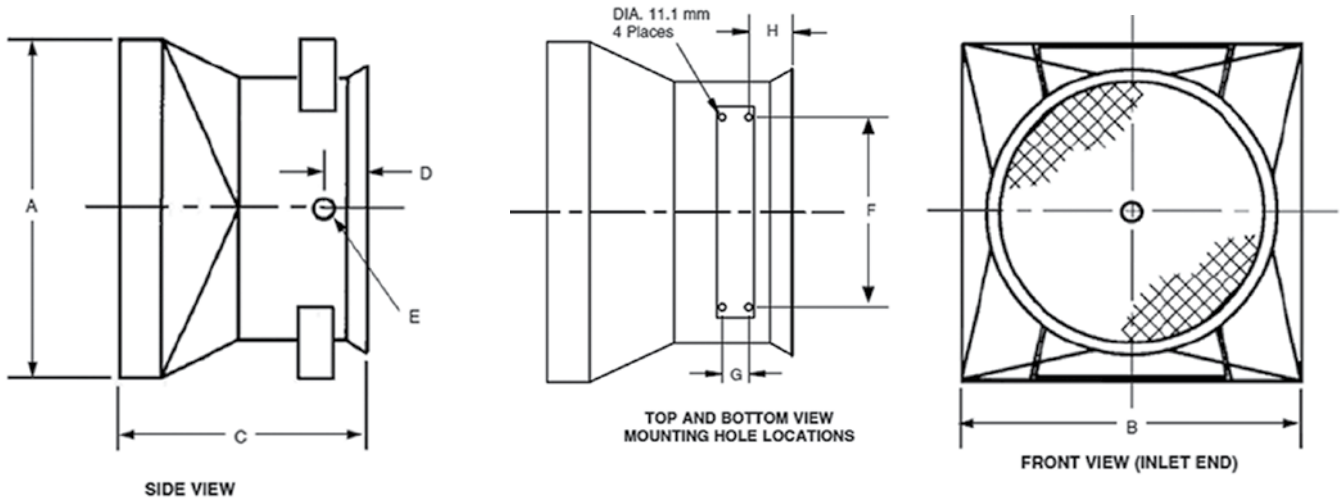
Therefore, use six HIEX-27 generators at 773 cmm each (see Table 2 for options)

General Dimensional Information and Performances

HIEX-5A



HIEX-15A & HIEX-15A LNG



Model	A mm	B mm	C mm	D mm	E* NPT (in.)	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M mm	Weight kg
HIEX-5A	1130	1069	1024	154	1½″	686	470	156						116
HIEX-15A	1629	1629	1178	219	2″	914	127	213						180
HIEX-15A LNG	1629	1629	1178	219	2″	914	127	213						180
HIEX-27	1638	1607	2375	613	3″	914	127	348	1143	203	1543	1016	819	327

HIEX-27

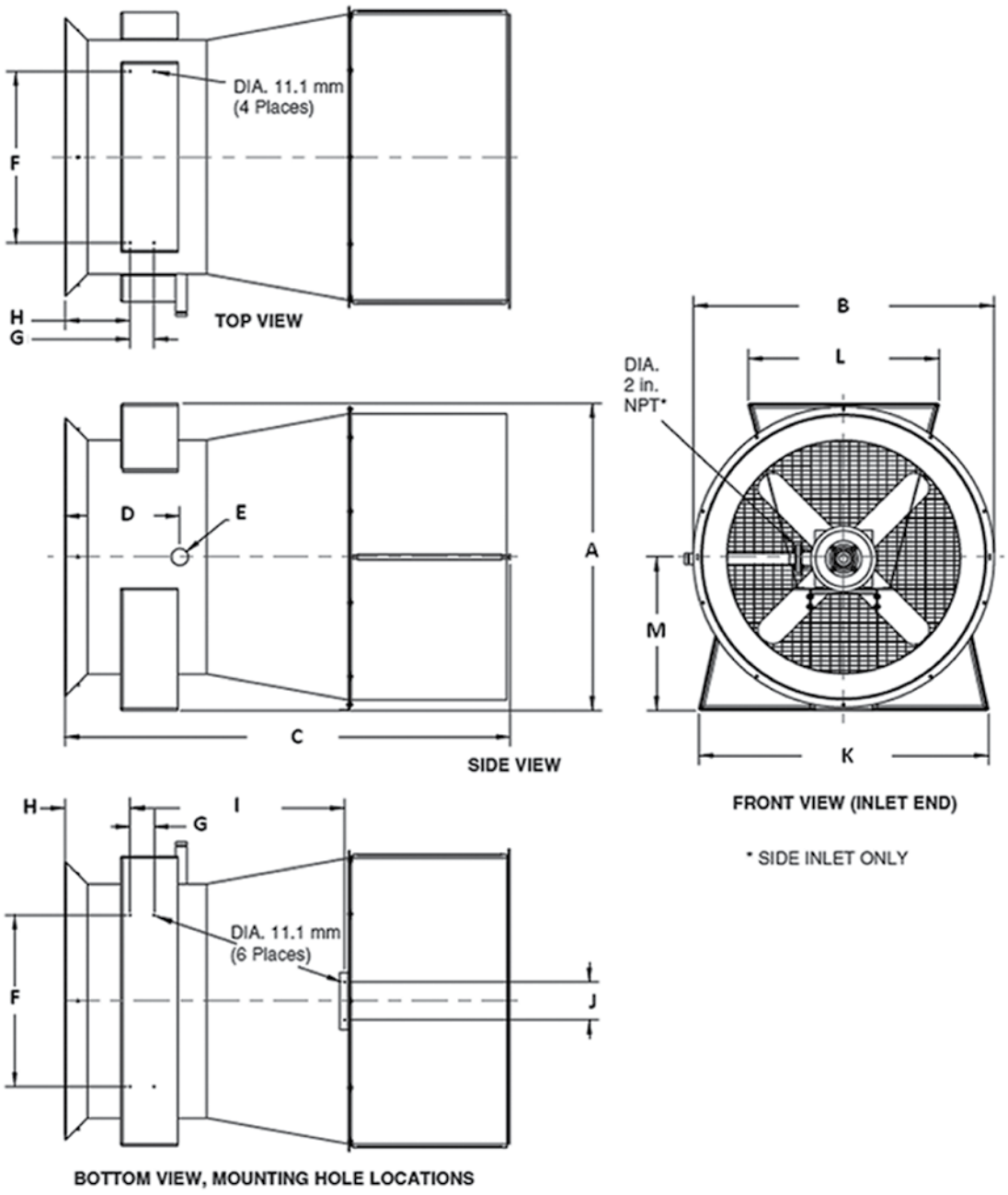


Table 2

Model	Generator Inlet Pressure (bar)	Foam Output M^3/min	Solution Flow L/min	Expansion
HIEX-5A	3.4	189	231	816:1
	5.2	266	284	936:1
	6.9	302	329	916:1
HIEX-15A	2.8	343	409	840:1
	3.4	410	450	911:1
	5.2	542	549	987:1
	6.9	617	640	965:1
HIEX-15A LNG	3.4	367	681	538:1
	5.2	503	833	604:1
	6.9	552	984	561:1
HIEX-27	2.8	575	685	839:1
	3.4	679	768	883:1
	5.2	773	920	840:1
	6.9	816	1045	781:1