

# JET-X® HIGH-EXPANSION FOAM GENERATORS

## Data/Specifications



### FEATURES

- Reliable, Water Motor Powered
- No Electrical Power Requirements
- ▶ ■ Foam Capacities to 28,800 CFM (816 m<sup>3</sup>/m)
- UL Listed Models
- FM Approved Models
- All Models Have CE Marking



001273

### APPLICATION

- ▶ Depending on the type of hazard and its configuration, a JET-X® High-Expansion Foam System may be designed for total flooding (discharging foam into an enclosed space around the hazard) or local application (designed to discharge foam directly onto the fire or spill). Common applications suited for high-expansion foam include:
  - Aircraft Hangars
  - Hazardous Waste Storage
  - Paper Product Warehouse
  - Tire Warehouse
  - 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

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 vapor concentrations downwind from unignited LNG and other hazardous low-boiling-point gaseous products such as ammonia spills.

### 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

**Note:** Tests conducted by Massachusetts Institute of Technology conclude that high-expansion foam can be used to extinguish fires in rooms containing electrical equipment with little or no damage to the equipment from the foam. If the foam is allowed to dissipate, a very minute residue will be found which can easily be cleaned up.

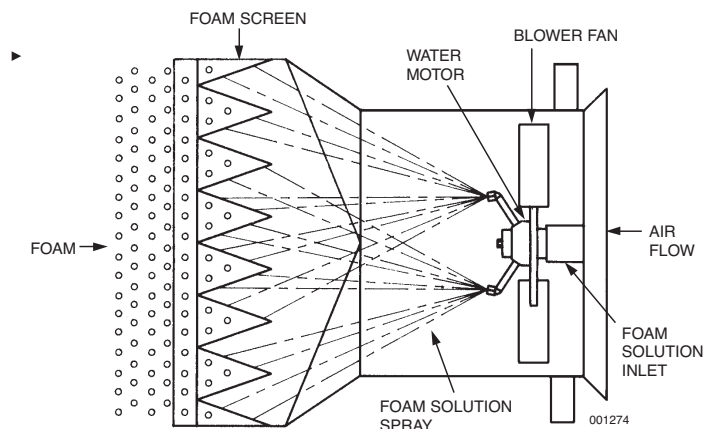
### DESCRIPTION

JET-X 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 JET-X High-Expansion Foam Concentrate, while a high volume of air is blown on the screen to produce the expanded foam. A continuous supply of JET-X foam solution to the JET-X generator enables the development of a large volume of foam. The largest JET-X generator will produce 28,800 ft<sup>3</sup> per minute (816 m<sup>3</sup> per minute) of foam at 100 psi (6.9 bar) inlet pressure. All JET-X generators are water-powered and require no other source of power, such as electric motors or gasoline engines.

Extinguishment mechanisms of JET-X High-Expansion Foam Systems 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 autoignition 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
- ▶ See Tables 1 and 2 for performance characteristics.

### GENERATOR COMPONENT INFORMATION



## 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. The JET-X generators carry the listings as indicated in Table 3.

## SPECIFICATIONS

Where required, the foam generator shall be powered by a water reaction motor. The water reaction motor shall provide both the screen wetting solution and the energy to drive the fan.

The foam generator shall not require any outside power source, such as electricity or gasoline engines.

All foam generators designed for fixed installations shall be equipped with a stainless steel screen for maximum reliability under fire conditions.

The proportioning system normally used for a high-expansion foam system shall be of the balanced pressure type utilizing a bladder tank and proportioner to provide metering accuracy with minimal loss of available pressure from the water supply.

## 2% PERFORMANCE CHARACTERISTICS

Model No.	Generator Inlet Pressure		Foam Output		Solution Flow		Expansion
	psi	bar	cfm	cmm	gpm	Lpm	
JET-X-2A	50	3.4	1,854	53	35	132	396:1
	75	5.2	2,777	79	42	159	495:1
JET-X-5A	50	3.4	6,658	189	61	231	816:1
	75	5.2	9,383	266	75	284	936:1
	100	6.9	10,655	302	87	329	916:1
JET-X-15A (UL)	40	2.8	12,121	343	108	409	840:1
	50	3.4	14,491	410	119	450	911:1
	75	5.2	19,141	542	145	549	987:1
	100	6.9	21,796	617	169	640	965:1
JET-X-15A (LNG)	50	3.4	12,949	367	180	681	538:1
	75	5.2	17,769	503	220	833	604:1
	100	6.9	19,503	552	260	984	561:1
JET-X-20	40	2.8	13,530	383	212	803	477:1
	50	3.4	14,746	418	238	901	463:1
	75	5.2	19,007	538	294	1,113	484:1
	100	6.9	22,598	640	338	1,279	500:1
JET-X-27	40	2.8	20,295	575	181	685	839:1
	50	3.4	23,965	679	203	768	883:1
	75	5.2	27,303	773	243	920	840:1
	100	6.9	28,802	801	276	1,045	781:1

TABLE 1

### NOTES:

- 2% concentrate not to be used for salt water applications.
- JET-X 2% and JET-X 2 3/4% concentrates are not to be mixed for normal system operation.

## 2 3/4% PERFORMANCE CHARACTERISTICS

Model No.	Generator Inlet Pressure		Foam Output		Solution Flow		Expansion
	psi	bar	cfm	cmm	gpm	Lpm	
JET-X-2A	50	3.4	2,240	63	35	132	465:1
	75	5.2	3,200	91	42	159	555:1
	100	6.9	3,735	106	50	189	545:1
JET-X-5A	50	3.4	5,700	161	61	231	700:1
	75	5.2	7,500	212	75	284	750:1
	100	6.9	8,000	227	87	329	685:1
JET-X-15A (UL)	50	3.4	13,880	393	119	450	870:1
	75	5.2	17,410	493	145	549	900:1
	100	6.9	19,545	553	169	640	865:1
JET-X-15A (FM)	50	3.4	12,985	368	105	397	925:1
	75	5.2	17,985	509	128	485	1050:1
	100	6.9	17,100	484	150	568	855:1
JET-X-15A (LNG)	50	3.4	12,625	358	180	681	525:1
	75	5.2	14,495	410	220	833	495:1
	100	6.9	18,240	516	260	984	525:1
JET-X-20	40	2.8	13,443	381	212	803	474:1
	50	3.4	16,034	454	238	901	504:1
	75	5.2	21,145	599	294	1,113	538:1
	100	6.9	24,301	688	338	1,279	538:1

TABLE 2

## TYPICAL JET-X 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

Size of Building:

- 100 ft (30.5 m) x 30 ft (9.1 m) = 3000 ft<sup>2</sup> (278 m<sup>2</sup>)
- Height of building 10 ft (3 m) = Volume of 30000 ft<sup>3</sup> (850 m<sup>3</sup>)

### CALCULATION WITHOUT SPRINKLERS

$$R = \frac{(V)}{(T)} \times C_N \times C_L$$

R = Rate of Discharge (CFM)

V = Submergence Volume (cubic feet)

T = Submergence Time (minutes)

C<sub>N</sub> = Compensation for normal shrinkage (1.15 constant)

C<sub>L</sub> = Compensation for leakage

(1.0 no leakage)

(1.2 moderate leakage)

$$\begin{aligned} R &= \frac{30000 \times 1.15 \times 1}{3} = 10000 \times 1.15 \times 1 \\ &= 11500 \text{ cubic feet per minute required} \end{aligned}$$

Metric:

$$\begin{aligned} R &= \frac{850 \times 1.15 \times 1}{3} = 283.3 \times 1.15 \times 1 \\ &= 326 \text{ cubic meters per minute required} \end{aligned}$$

- Therefore, use two JET-X-5A generators at 6000 CFM (170 m<sup>3</sup>/m) each

### TYPICAL JET-X SYSTEM CALCULATION (Local Application)

Group II Aircraft Hangar (Using Inside Air to Generators)

Hangar to be protected is:

- ▶ Group II hangar measuring 33,000 ft<sup>2</sup> (3066 m<sup>2</sup>)
- ▶ Sprinkler system (wet pipe) for 0.17 gpm/ft<sup>2</sup> over 5000 ft<sup>2</sup> (6.9 lpm/m<sup>2</sup> over 465 m<sup>2</sup>)

Fill time:

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

Size of building:

- ▶ 150 ft x 220 ft = 33,000 ft<sup>2</sup> (46 m x 67 m = 3082 m<sup>2</sup>)

#### CALCULATION WITH SPRINKLERS

$$R = (V/T) + R_S \times C_N \times C_A$$

$R_S$  = Rate of foam breakdown by sprinklers (10 cfm/gpm of sprinkler discharge)

$C_A$  = Compensation for inside air (1.20 constant – ANSUL® test criteria)

$C_L$  = Leakage factor not required for local application system

$$R = [(99000 \text{ ft}^3/1 \text{ min}) + 8500 \text{ cfm}] \times 1.15 \times 1.2 = 107500 \times 1.15 \times 1.2 = 148350 \text{ cubic feet per minute minimum required}$$

▶ Metric:

$$R = [(2803 \text{ m}^3/1 \text{ min}) + 241 \text{ m}^3/\text{m}] \times 1.15 \times 1.2 = 3044 \times 1.15 \times 1.2 = 4201 \text{ cubic meters per minute minimum required}$$

148350 / 27,303 CFM (4201/773 m<sup>3</sup>/m) per generator

JET-X-27 @ 75 psi (5.2 bar) = 5.43

- ▶ Therefore, use six JET-X-27 generators at 27,303 CFM (773 m<sup>3</sup>/m) each

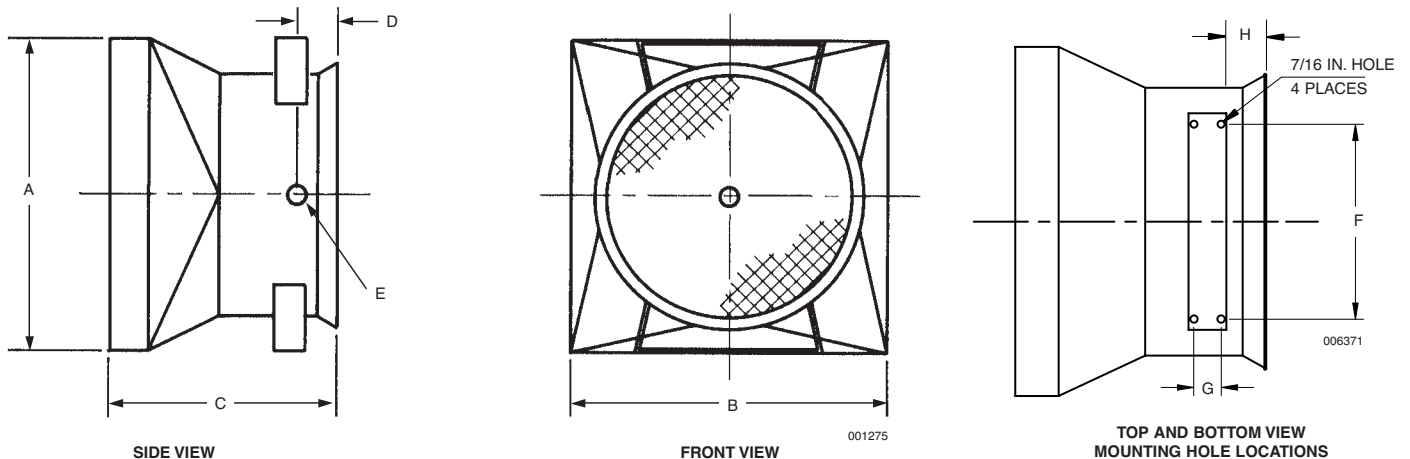
### ORDERING INFORMATION

Part No.	Model	Unit Weights		2 3/4% Approval	2% Approval
		lb	(kg)		
420001	JET-X-2A	73	33	CE	UL, CE
420002	JET-X-5	255	116	UL, FM, CE	CE
420003	JET-X-5A	255	116	FM, CE	UL, CE
420005	JET-X-15A (UL)	397	180	UL, CE	UL, CE
420006	JET-X-15A (FM)	397	180	FM, CE	CE
420007	JET-X-15A (LNG)	397	180	UL, CE	UL, CE
421590	JET-X-20	397	180	UL, CE	UL, CE
436899	JET-X-27	720	327	UL, CE	UL, CE
<b>Stainless Steel*:</b>					
471066	JET-X 2A	73	33	CE	UL, CE
436936	JET-X-5A	255	116	CE	UL, CE
436878	JET-X-15A (UL)	398	180	UL, CE	UL, CE
472526	JET-X-15A (LNG)	398	180	UL, CE	UL, CE
471871	JET-X-20	397	180	UL, CE	UL, CE

\*Stainless Steel Hosing and Motor Brackets

TABLE 3

### GENERAL DIMENSIONAL INFORMATION - JET-X-2A, -5, -5A, -15A (UL, FM, OR LNG), -20



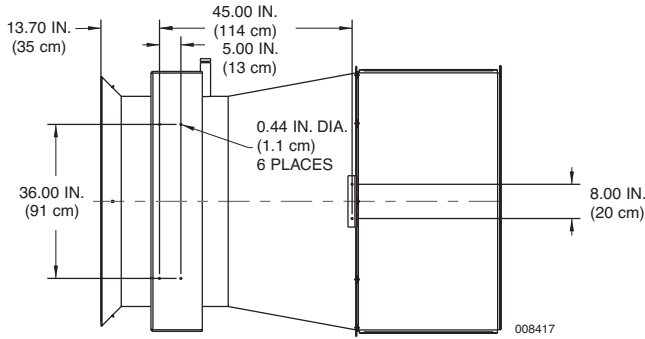
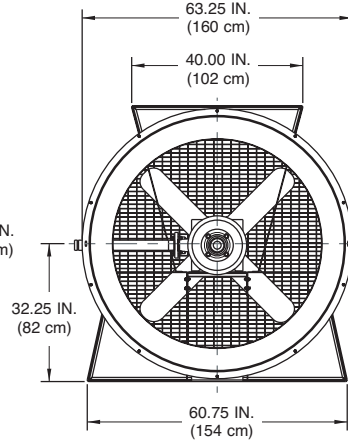
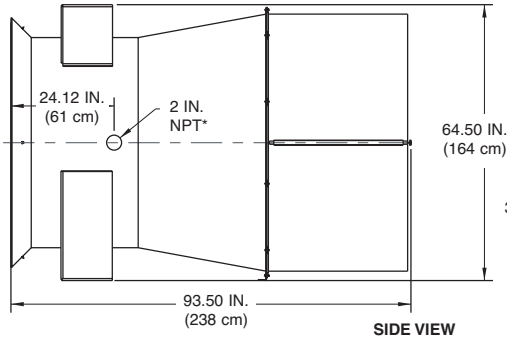
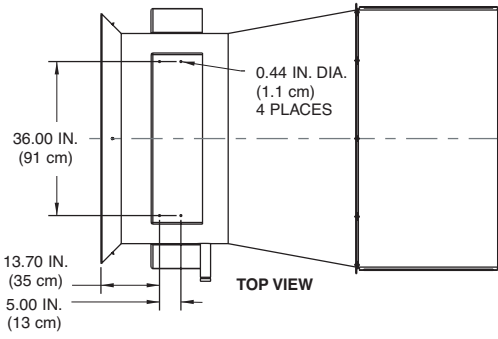
Model	A		B		C		D		E*	F		G		H	
	in.	(cm)	in.	(cm)	in.	(cm)	in.	(cm)	NPT	in.	(cm)	in.	(cm)	in.	(cm)
▶ JET-X-2A	25.00	63	25.00	63	30	76	4.0	10	1 in.	—	—	—	—	—	—
JET-X-5	42.00	107	42.00	107	40	101	7.0	18	1.5 in.	27	69	—	—	—	—
JET-X-5A	42.00	107	42.00	107	40	101	7.0	18	1.5 in.	27	69	—	—	—	—
JET-X-15A (UL)	64.00	163	64.00	163	46	117	8.5	22	2 in.	36	91	5	13	8	20
JET-X-15A (FM)	64.00	163	64.00	163	46	117	8.5	22	2 in.	36	91	5	13	8	20
JET-X-15A (LNG)	64.00	163	64.00	163	46	117	8.5	22	2 in.	36	91	5	13	8	20
JET-X-20	64.00	163	64.00	163	46	117	8.5	22	2 in.	36	91	5	13	8	20

▶ All units are available with rear and side inlets

Exception: JET-X-15A (LNG) and JET-X-20 are rear inlet only.

TABLE 4

**GENERAL DIMENSIONAL INFORMATION - JET-X-27**



**NOTE: JET-X-27 GENERATOR IS UL LISTED AND CE MARKED.**

\* SIDE INLET ONLY

## HIGH-EXPANSION LOUVERS/DAMPERS

### Application

ANSUL electric actuated dampers and louvers are available when the use of outside air is required to generate a high-expansion foam blanket. These devices are especially suited for total flooding high-expansion foam systems where combustion products (smoke and soot) and heat produced from the material(s) involved would inhibit foam production. In warmer climates, air exchange may be unnecessary, and actuated dampers and louvers may not be required. However, in cold weather climates, they may be mandatory to reduce building heat loss during winter conditions.

NFPA 11 Standard for "Low, Medium and High-Expansion Foam

- Systems" states "air from outside the hazard area shall be used for foam generation unless data is provided to show that air from inside the hazard can be successfully employed." ANSUL has done testing with inside air and there are specific applications where it is recommended. If

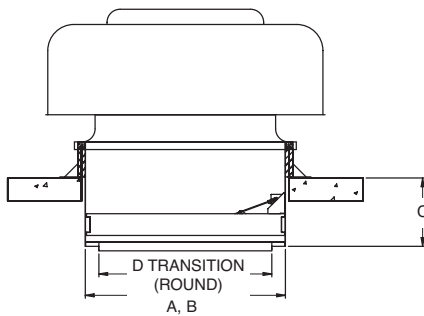
- ▶ you have specific questions concerning this matter, contact ANSUL Technical Services.

### Description

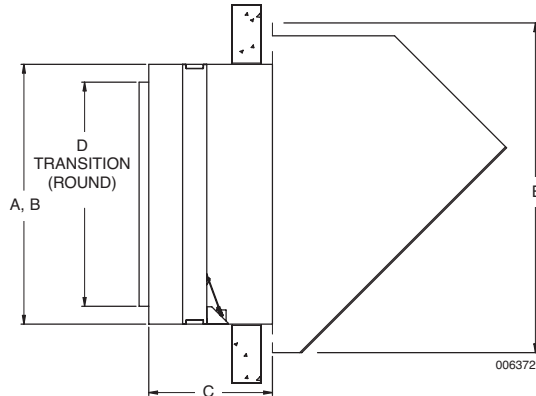
The ANSUL actuated dampers and louvers are powered by 110 VAC and are fail-safe open devices. Energized, the damper or louver is closed with loss of power to open. They are available with either NEMA 4 or NEMA 7 actuators.

- Air intake dampers are available for wall or roof mounting. The wall mount damper is a complete package inclusive of the damper with actuator, weatherhood with birdscreen, and transition piece to intake of generator. The roof mount damper includes the same features as the wall mount damper as well as roof curbing. Wall relief louvers are comprised only of a louver with actuator and birdscreen. Wall relief louvers are not required where adequate venting exists.

15/20/27\* ROOF INTAKE DAMPER ASSEMBLY

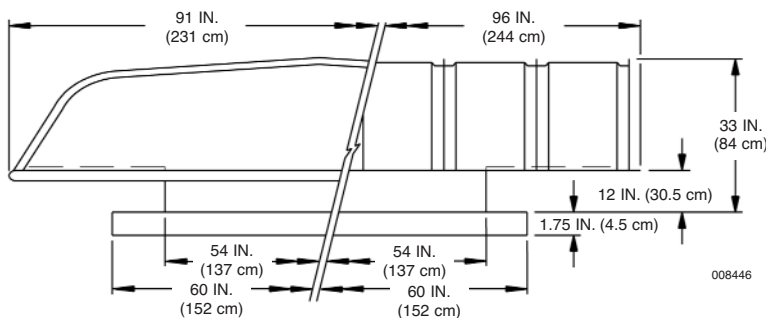


WALL INTAKE DAMPER ASSEMBLY

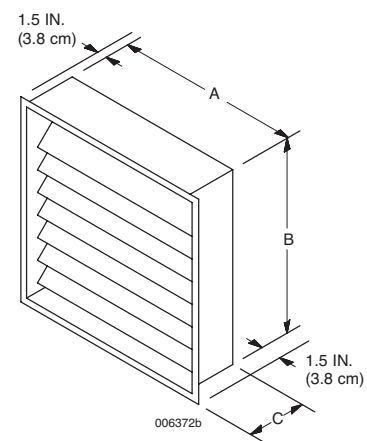


NOTE: ADDITIONAL DETAILED INSTALLATION DRAWINGS ARE AVAILABLE. CONTACT ANSUL TECHNICAL SERVICES FOR DETAILS.

\*27 WEATHER HOOD



WALL RELIEF LOUVER ASSEMBLY



### ORDERING INFORMATION - DIMENSIONS

Part No. NEMA 4 / 7	Model	Clearance Dimensions*										Shipping Weights**	
		A		B		C		D		E		lb	(kg)
		in.	(cm)	in.	(cm)	in.	(cm)	in.	(cm)	in.	(cm)		
430060 / 430061	Wall Intake Damper Assembly – JET-X-5/5A	44.5	113	44.5	113	24	61	42	107	50	(127)	241	109
430062 / 430063	Roof Intake Damper Assembly – JET-X-5/5A	46.5	118	46.5	118	16	40.6	42	107	—	—	285	129
430064 / 430065	Wall Relief Louver Assembly – JET-X-5/5A	30.5	77	48.5	123	6	15.2	—	—	—	—	50	23
430066 / 430067	Wall Intake Damper Assembly – JET-X-15/20	54.5	138	54.5	138	24	61	53	135	62.5	(159)	315	143
430068 / 430069	Roof Intake Damper Assembly – JET-X-15/20	54.5	138	54.5	138	16	40.6	53	135	—	—	360	164
430070 / 430071	Wall Relief Louver Assembly – JET-X-15/20/27	60.5	154	84.5	215	6	15.2	—	—	—	—	140	64
437018/437097	Roof Intake Damper Assembly – JET-X-27	54.5	138	54.5	138	24	61	53	135	—	—	525	238

\* Actual dimensions of equipment will be approximately 0.25 in. (6.4 mm) smaller than clearance dimensions listed.

\*\* Weights listed are for NEMA 4 models; add 20 lb (9.1 kg) for NEMA 7 models.

TABLE 5

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