ANSUL® JET-X High-Expansion Foam Generators

Features

- UL Listed and CE Marked
- FM Approved models available
- LNG specific models available
- Water-powered so no electrical power is required
- Foam capacities of up to 29,900 cfm (847 cmm)

Application

ANSUL® JET-X High-Expansion Foam Generators are intended for use in total flooding or local application high-expansion foam systems. Total flooding high-expansion foam systems are commonly used to protect the following hazards:

- Flammable liquid storage areas
- Hazardous waste storage areas
- Ship holds
- Engine rooms

Local application foam systems are commonly used to protect aircraft hangars. High-expansion foam systems are also frequently used to protect LNG facilities. These systems are typically used to control the vaporization rate of LNG spills or reduce the intensity of LNG fires by controlling the rate of vapor release.

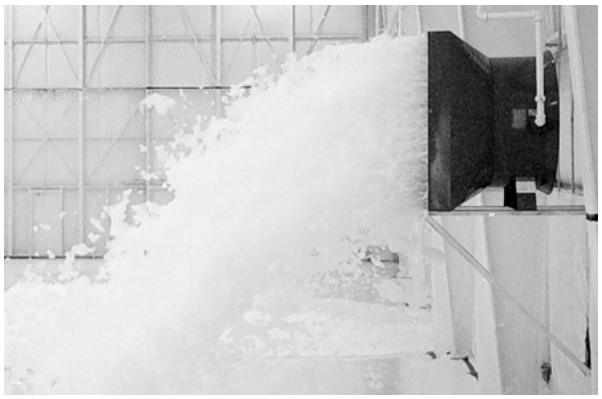
Note: High-expansion foam generators used in LNG applications typically require expansion ratios of approximately 500:1.

Description

ANSUL JET-X High-Expansion Foam Generators produce large volumes of foam by coating a stainless steel perforated metal screen with high-expansion foam solution and expanding it with airflow generated by a water-powered fan. When used with ANSUL JET-X 2% or JET-X 2.75% High-Expansion Foam Concentrates, these generators are capable of producing finished foam with expansion ratios from 336:1 up to 987:1, depending on the model and operating pressure.

Protective Coatings

Standard generator model housings are constructed of galvanized or bare carbon steel base material and are painted using a UL Listed paint system. All fans are painted using a marine-grade powder paint system tested to a minimum of 3,000 hours in salt spray corrosion testing to ensure adherence and durability. LNG generator models are constructed of pickled and passivated 316L stainless steel for corrosion resistance in the most challenging environments. Stainless steel foam screens are not painted to avoid inhibiting foam production.



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Approvals and Certifications

UL Listed

ANSUL High-Expansion Foam Generators are UL Listed for use with either the ANSUL JET-X 2% High-Expansion Foam Concentrate or ANSUL JET-X 2.75% High-Expansion Foam Concentrate.

FM Approved

The JET-X 5A, JET-X 15A, and JET-X 27 models are FM Approved for use with ANSUL JET-X 2% High-Expansion Foam Concentrate.

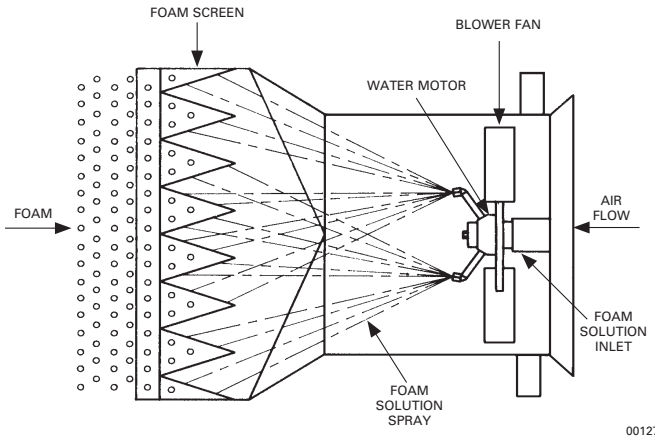
CE Marked

All models are CE Marked in conformance with the Machinery Directive 2006/42/EC.

Operation and Maintenance

Refer to the ANSUL JET-X High-Expansion Foam Generator Operation and Maintenance Manual for detailed procedures on installation, operation, and maintenance. A printed copy of this manual is included with every generator.

Foam Generator Components



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 | Form No. F-93137-12

Johnson Controls

Materials of Construction

ANSUL JET-X High-Expansion Foam Generators are manufactured from a combination of carbon steel, stainless steel, and brass components. For materials of construction of the major components, see the following table:

Component	Material			
Model	Standard Models: JET-X 2A, JET-X 5A, JET-X 15A, JET-X 20	Standard Models: JET-X 27	LNG Models: JET-X 2A LNG, JET-X 5A LNG, JET-X 20 LNG	Standard Models: JET-X 3
Housing	Galvanized Steel	Galvanized Steel	316L SS, Pickled and Passivated	Carbon Steel
Foam Screen	201, 302, or 304 SS	201, 302, or 304 SS	316 or 316L SS	304 SS
Fan	Carbon Steel*	Carbon Steel*	Carbon Steel*	304 SS Blades, 302 SS Rivets, Zinc Plated Carbon Steel, or 304 SS Hub
Water Motor	Brass	Cast Iron/Bronze	Brass	Cast Iron/Bronze
Nozzle(s)	Brass	Brass	Brass	Brass

*Carbon Steel fans are powder painted with a durable, marine-grade paint system for corrosion resistance.

Performance Data

UL Listed Performance (JET-X 2%)										
Generator Model		**Part Number**	**UL Listed Orientation**	**Inlet Pressure**		**Flow Rate**		**Foam Output**		**Expansion Ratio**
				psi	**bar**	**gpm**	**Lpm**	**cfm**	**cmm**	
JET-X 2A	Standard	420001	Horizontal or Vertical	50	3.4	35	132	2,188	62	468
	LNG	471066		75	5.2	42	159	2,727	77	486
				100	6.9	50	189	3,010	85	450
JET-X 3	Standard	448163	Horizontal or Vertical	50	3.4	60	227	2,834	80	356
				60	4.1	66	250	3,088	87	353
				70	4.8	70	265	3,336	94	356
				80	5.5	77	291	3,616	102	354
				90	6.2	80	303	3,808	108	358
				100	6.9	84	318	3,753	106	336
JET-X 5A	Standard	420003	Horizontal or Vertical	50	3.4	61	231	6,658	189	816
	LNG	436936		75	5.2	75	284	9,383	266	939
				100	6.9	87	329	10,655	302	916
JET-X 15A	Standard	420005	Horizontal or Vertical	40	2.8	108	409	12,121	343	840
				50	3.4	119	450	14,491	410	911
				75	5.2	145	549	19,141	542	987
				100	6.9	169	640	21,796	617	965
JET-X 20	Standard	421590	Horizontal or Vertical	40	2.8	212	803	13,530	383	477
				50	3.4	238	901	14,746	418	463
	LNG	471871		75	5.2	294	1113	19,007	538	484
				100	6.9	338	1279	22,598	640	500
JET-X 27	Standard	436899	Horizontal or Vertical	40	2.8	181	685	20,295	575	839
				50	3.4	203	768	23,965	679	883
				75	5.2	243	920	27,303	773	840
				100	6.9	276	1045	28,802	816	781

Performance Data (Continued)

FM Approved Performance (JET-X 2%)										
Generator Model		Part Number	FM Approved Orientation	Inlet Pressure		Flow Rate		Foam Output		Expansion Ratio
				psi	bar	gpm	Lpm	cfm	cmm	
JET-X 5A	Standard	420003	Horizontal	40	2.8	55	208	4,020	114	547
				50	3.4	62	235	5,184	147	625
	LNG	436936		75	5.2	76	288	7,632	216	751
				100	6.9	88	333	7,794	221	662
JET-X 15A	Standard	420005	Horizontal	40	2.8	107	405	9,540	270	667
				50	3.4	119	450	12,150	344	764
				75	5.2	149	562	17,100	484	861
				100	6.9	174	659	19,296	546	829
JET-X 27	Standard	436899	Horizontal or Vertical	40	2.8	184	697	19,548	554	795
				50	3.4	202	765	21,600	612	800
				75	5.2	244	924	27,036	766	829
				100	6.9	280	1060	29,916	847	799

Notes: 1. JET-X 2% concentrate should not be used for salt water applications.

2. JET-X 2% and JET-X 2.75% concentrates should not be mixed for normal system operation.

UL Listed Performance (JET-X 2.75%)										
Generator Model		Part Number	UL Listed Orientation	Inlet Pressure		Flow Rate		Foam Output		Expansion Ratio
				psi	bar	gpm	Lpm	cfm	cmm	
JET-X 2A	Standard	420001	Horizontal or Vertical	50	3.4	35	132	2,122	60	454
				75	5.2	42	159	2,785	79	496
	LNG	471066		100	6.9	50	189	3,163	90	473
JET-X 5A	Standard	420003	Horizontal or Vertical	50	3.4	61	231	5,575	158	684
				75	5.2	75	284	6,628	188	661
	LNG	436936		100	6.9	87	329	7,182	203	617
JET-X 15A	Standard	420005	Horizontal or Vertical	50	3.4	119	450	11,269	319	708
				75	5.2	145	549	15,479	438	799
				100	6.9	169	640	18,447	522	816
JET-X 20	Standard	421590	Horizontal or Vertical	40	2.8	212	803	13,443	381	474
				50	3.4	238	901	16,034	454	504
	LNG	471871		75	5.2	294	1113	21,145	599	538
				100	6.9	338	1279	24,301	688	538

Note: JET-X 2% and JET-X 2.75 % concentrates should not be mixed for normal system operation.

System Calculation for Total Flooding

Building

- Light steel construction
- Non-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).

Building Area

100 ft (30.5 m) × 30 ft (9.1 m) = 3,000 ft^2 (278 m^2)

Building Height

10 ft (3 m) = Volume (V) of 30,000 ft^3 (850 m^3)

Calculation Without Sprinklers

$R = (V/T) \times C_N \times C_L$

R = Rate of Discharge in cfm

V = Submergence Volume in ft^3

T = Submergence Time in minutes

C_N = Compensation for normal shrinkage (1.15, constant)

C_L = Compensation for leakage

1.0, no leakage

1.2, moderate leakage

R = (30,000 ft^3 / 3 min) × 1.15 × 1 =
10,000 × 1.15 × 1

= 11,500 cfm required

11,500 cfm/6,658 cfm per JET-X 5A @ 50 psi
= 1.73 generators

Metric Calculation

R = (850 m^3 / 3 min) × 1.15 × 1

= 283.3 × 1.15 × 1

= 326 cmm required

326 cmm / 189 cmm per JET-X 5A @ 3.4 bar
= 1.73 generators

Therefore, use two JET-X 5A generators at 6,658 cfm (189 cmm) each.

System Calculation for Local Application

Group II aircraft hangar using outside air to generators.

Hangar to be protected

- Group II hangar measuring 33,000 ft^2 (3066 m^2)
- Sprinkler system (wet pipe) for 0.17 gpm/ft^2 over 5000 ft^2 (6.9 Lpm/m^2 over 465 m^2)

Fill time

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

Building Area

150 ft × 220 ft = 33,000 ft^2 (45.7 m × 67.1 m = 3066 m^2)

Foam Volume (V)

33,000 ft^2 × 3 ft = 99,000 ft^3 (2803 m^3)

Calculation With Sprinklers

$R = ([V/T] + R_s) \times C_N \times C_A^* \times C_L$

R_s = Rate of foam breakdown by sprinklers 10 cfm/gpm × sprinkler system discharge in gpm (0.075 cmm/Lpm × sprinkler discharge in Lpm)

C_N = Compensation for normal shrinkage (1.15 constant)

C_A* = Compensation for inside air (1.20 constant)

C_L = Leakage factor (not required for local application systems)

R = ([99,000 ft^3 / 1 min] + 8500 cfm) × 1.15

= 107,500 × 1.15

= 123,625 cfm minimum required

123,625 cfm / 27,303 cfm per JET-X 27 @ 75 psi
= 4.53 generators

Metric Calculation

R = ([2803 m^3 / 1 min] + 241 cmm) × 1.15

= 3044 × 1.15

= 3501 cmm minimum required

3501 cmm / 773 cmm per JET-X 27 @ 5.2 bar
= 4.53 generators

Therefore, use five JET-X 27 generators at 27,303 cfm (773 cmm) each.

*Inside air may be used with AHJ approval. When using inside air, Johnson Controls recommends using the 20% compensation factor (C_A) noted in the calculation for R. Contact Johnson Controls Technical Services with questions on use of inside air for high-expansion foam systems.

Ordering Information

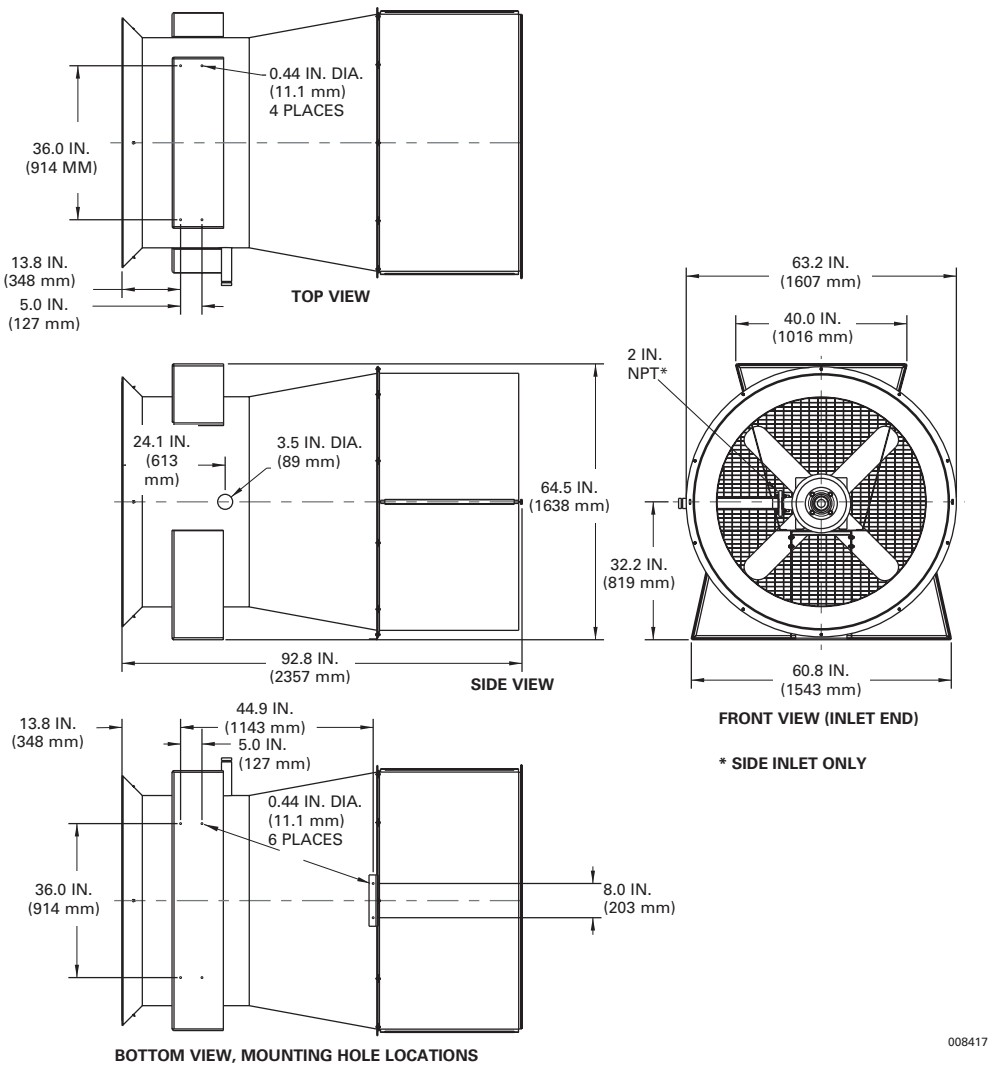
Standard Models (Carbon Steel Construction)

Part Number	Generator Model	Weight lb	(kg)	2% Approvals	2.75% Approvals
420001	JET-X 2A	73	(33)	UL, CE	UL, CE
448163	JET-X 3	115	(52)	UL, CE	
420003	JET-X 5A	255	(116)	UL, FM, CE	UL, CE
420005	JET-X 15A	397	(180)	UL, FM, CE	UL, CE
421590	JET-X 20	397	(180)	UL, CE	UL, CE
436899	JET-X 27	720	(327)	UL, FM, CE	CE

LNG Models (Stainless Steel Construction)

Part Number	Generator Model	Weight lb	(kg)	2% Approvals	2.75% Approvals
471066	JET-X 2A LNG	73	(33)	UL, CE	UL, CE
436936	JET-X 5A LNG	255	(116)	UL, FM, CE	UL, CE
471871	JET-X 20 LNG	398	(180)	UL, CE	UL, CE

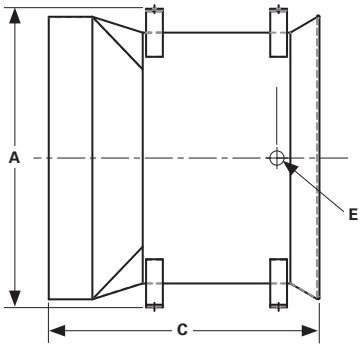
JET-X 27 Dimensions



Note: The converted values in this document are provided for dimensional reference only and do not reflect an actual measurement.

General Dimensions

JET-X 5A



SIDE VIEW

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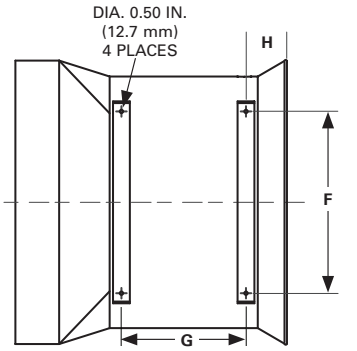

TOP AND BOTTOM VIEW
MOUNTING HOLE LOCATIONS

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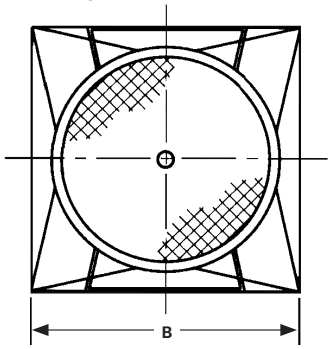
All Square Outlet Models



FRONT VIEW (INLET END)

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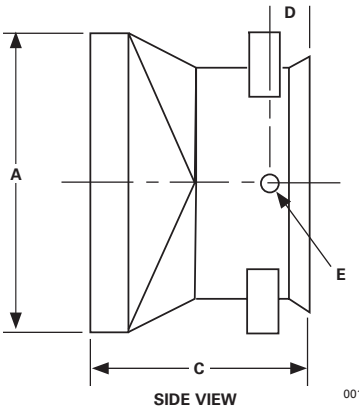
JET-X 2A, JET-X 15A, JET-X 20



SIDE VIEW

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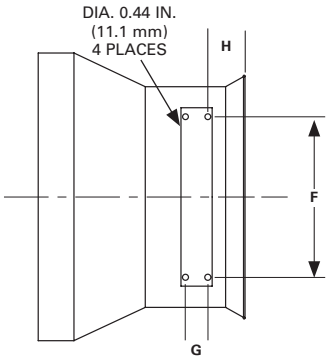

TOP AND BOTTOM VIEW
MOUNTING HOLE LOCATIONS

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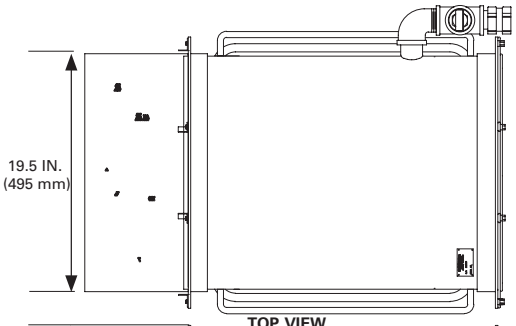
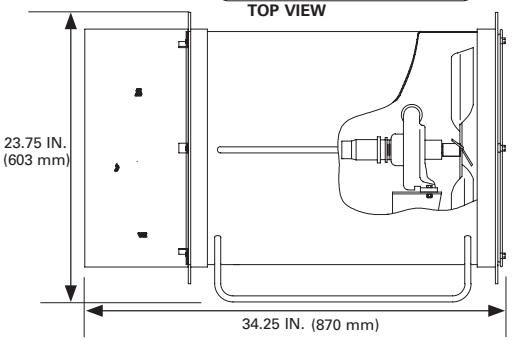
Model	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)	D in.	D (mm)	E NPT – in.	F in.	F (mm)	G in.	G (mm)	H in.	H (mm)
JET-X 2A	25.0	(635)	25.0	(635)	30.1	(764)	3.9	(99)	1.0	16.0	(406)	–	–	3.3	(83)
JET-X 5A	44.5	(1130)	42.1	(1069)	40.3	(1024)	6.4	(154)	1.5	27.0	(686)	18.5	(470)	6.1	(156)
JET-X 15A	64.0	(1629)	64.0	(1629)	46.0	(1178)	8.5	(219)	2.0	36.0	(914)	5.0	(127)	8.0	(213)
JET-X 20	64.0	(1629)	64.0	(1629)	46.0	(1178)	8.5	(219)	2.0	36.0	(914)	5.0	(127)	8.0	(213)

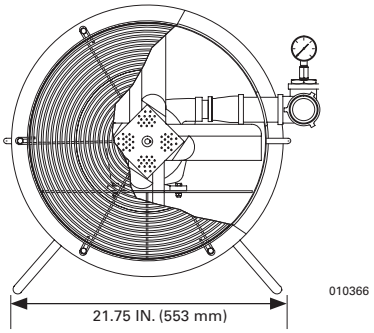
JET-X 3



TOP VIEW



SIDE VIEW



FRONT VIEW

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