



TECHNICAL DATA

MODEL GH250, GH400 & GH800 ASPIRATED HIGH EXPANSION GENERATOR VDS VARIANT

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
 Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
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1. GENERAL DESCRIPTION

Aspirated-type high expansion foam generators are designed to expand foam into a large volume of stable bubbles. Expansion rates up to 833:1 are possible due to jet streams of foam solution that aspirate a sufficient amount of air, which is then entrained onto perforated screens to produce high expansion foam. This high performance is achieved without any external power source or moving parts, which gives advantages for installation and reduces ongoing maintenance requirements.

High expansion generators are usually part of a fixed deluge or flow control system and shall be used in combination with a suitable foam proportioning system. Foam concentrates developed and tested to work in high expansion systems shall be used. It is critical to select a combination of generator and foam concentrate that have been developed and tested together to ensure critical parameters are achieved such as expansion, submergence height and fire performance.

High expansion foam systems are commonly used on hazards such as ordinary combustibles, flammable and combustible liquids or liquefied natural gas (LNG) for example. Such hazards are commonly found in applications such as aircraft hangars, warehouses, LNG facilities, cable tunnels, underground storage or recycling plants. High expansion foam systems should be brought into operation very quickly after the onset of fire so suitable detection and actuation systems should be provided.

High expansion generators installed in accordance with VdS 2108 shall use outside air unless otherwise agreed with the AHJ.

For further information, please contact the appropriate sales office in **Section 5 - Availability**, or refer to the technical documentation. The contents of this publication are subject to modifications without notice.

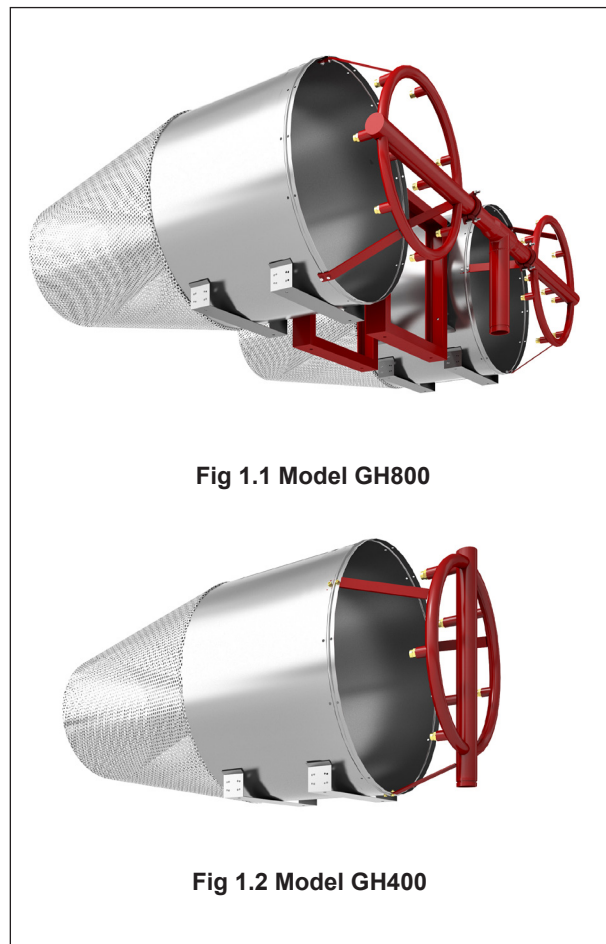


Fig 1.1 Model GH800

Fig 1.2 Model GH400

2. LISTINGS AND APPROVALS



Foam extinguishing systems, high expansion foam applicators
 Certified by VdS in accordance with EN13565-1

Certified by CNPP to APSAD T12 for Class B liquids



Certified by the Academy of the State Fire Service of the Ministry of Emergency Situations of Russia



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3. TECHNICAL DATA

3.1 Construction features

- 3 sizes with nominal flow rates of 60 GPM (228 l/min), 101 GPM (382 l/min), 202 GPM (764 l/min) @ 58 psi (4 bar)
- No moving parts and no external power requirements
- Vertical or horizontal installation
- Stainless steel body with carbon steel or stainless steel nozzle manifold
- Fixing points included
- Foam expansion up to 833:1 (depending on model and supply conditions)
- Grooved, flanged or threaded connection
- Suitable for the protection of Class A and Class B commodities according to VdS 2108 and EN13565-2

3.2 Standard materials

Table 3.2.1 - Standard Materials	
GH250, GH400, GH800 – High expansion generator	
Generator Inlet	GH250, GH400 - 2.5" (76.1 mm) grooved or BSP threaded GH800 - 3" (88.9 mm) grooved or ANSI / PN16 flanged
Nozzle manifold	Carbon steel ASME SA106 Gr.B or stainless steel ASME SA312 Tp.316
Nozzle manifold support arm	SA516 Gr.70
Nozzle	Brass EN CW614N
Nozzle K Factor	19.75 (Metric)
Body	Stainless steel AISI-430 (or AISI-304, or AISI-316, special request)
Support arm nuts, bolts & washers	AISI-304
Finish – Nozzle manifold	RAL3000 Flame Red
Finish - Body	Natural

3.3 Standard design specifications

Table 3.3.1 - Standard Design Specifications												
Model	Inlet size	Working pressure				Flow range				Nozzle qty	Net weight	
		Minimum		Maximum		Minimum		Maximum			lbs	kg
		psi	bar	psi	bar	GPM	LPM	GPM	LPM			
GH250-VDS	2.5"	44	3	102	7	53	200	77	291	6	128	58
GH400-VDS	2.5"	29	2	102	7	75	284	129	489	9	130	59
GH800-VDS	3"	29	2	102	7	150	568	258	978	18	305	138



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3.4 Ordering information

1. Select the required generator model based on project requirements and performance data in **Section 7**
2. Select the inlet connection
3. Select the nozzle manifold material

Table 3.4.1 - Ordering Information

Model	Part number	Inlet connection	Nozzle manifold	Finish	
				Nozzle manifold ²	Body
GH250-VDS	EGH250T-VDS	2.5" male BSP	Carbon steel	RAL3000	Natural
	EGH250V-VDS	2.5" (76.1 mm) grooved ¹	Carbon steel	RAL3000	Natural
	EGH250TS-VDS	2.5" male BSP	Stainless steel	RAL3000	Natural
	EGH250VS-VDS	2.5" (76.1 mm) grooved ¹	Stainless steel	RAL3000	Natural
GH400-VDS	EGH400T-VDS	2.5" male BSP	Carbon steel	RAL3000	Natural
	EGH400V-VDS	2.5" (76.1 mm) grooved ¹	Carbon steel	RAL3000	Natural
	EGH400TS-VDS	2.5" male BSP	Stainless steel	RAL3000	Natural
	EGH400VS-VDS	2.5" (76.1 mm) grooved ¹	Stainless steel	RAL3000	Natural
GH800-VDS	EGH800D-VDS	3" PN16 flange	Carbon steel	RAL3000	Natural
	EGH800V-VDS	3" (88.9 mm) grooved ¹	Carbon steel	RAL3000	Natural
	EGH800DS-VDS	3" PN16 flange	Stainless steel	RAL3000	Natural
	EGH800VS-VDS	3" (88.9 mm) grooved ¹	Stainless steel	RAL3000	Natural

¹ A PicoFix model 900 rigid pipe coupling (VdS Approval G410046) shall be used to connect the HEG to the piping network. Pipework preparation shall be roll grooved. Coupling part numbers can be found in **Section 13** of this data page.

² External pipe painting only

4. SCOPE OF DELIVERY

Ensure that all components are complete and in good condition.

Note: Due to the size of the high expansion generator, logistics planning is recommended at initial order stage.

Included

Unit is supplied with nozzles pre-installed into nozzle manifold pipework and main body with fixing points.

To enable manageable handling and reduce logistics costs the generator body and nozzle manifold is shipped separately. Site assembly of the body to the interconnecting support arms is required. Nuts, bolts and washers are supplied with each shipment in a separate package.

For additional information, please refer to **Operation & Maintenance Manual TM1.3.4.24**.

Not included

Fixing material, inlet connection coupling, and strainer.

5. AVAILABILITY

Please contact your local Viking sales office for further information.

The product is available directly from Viking and official distributors only.

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6. PRODUCT VARIANTS

6.1 Options

- Non-standard connections may be available on request (without VdS approval)
- Strainer (see section 13)
- AISI-304 or AISI-316 body

6.2 Generator dimensions

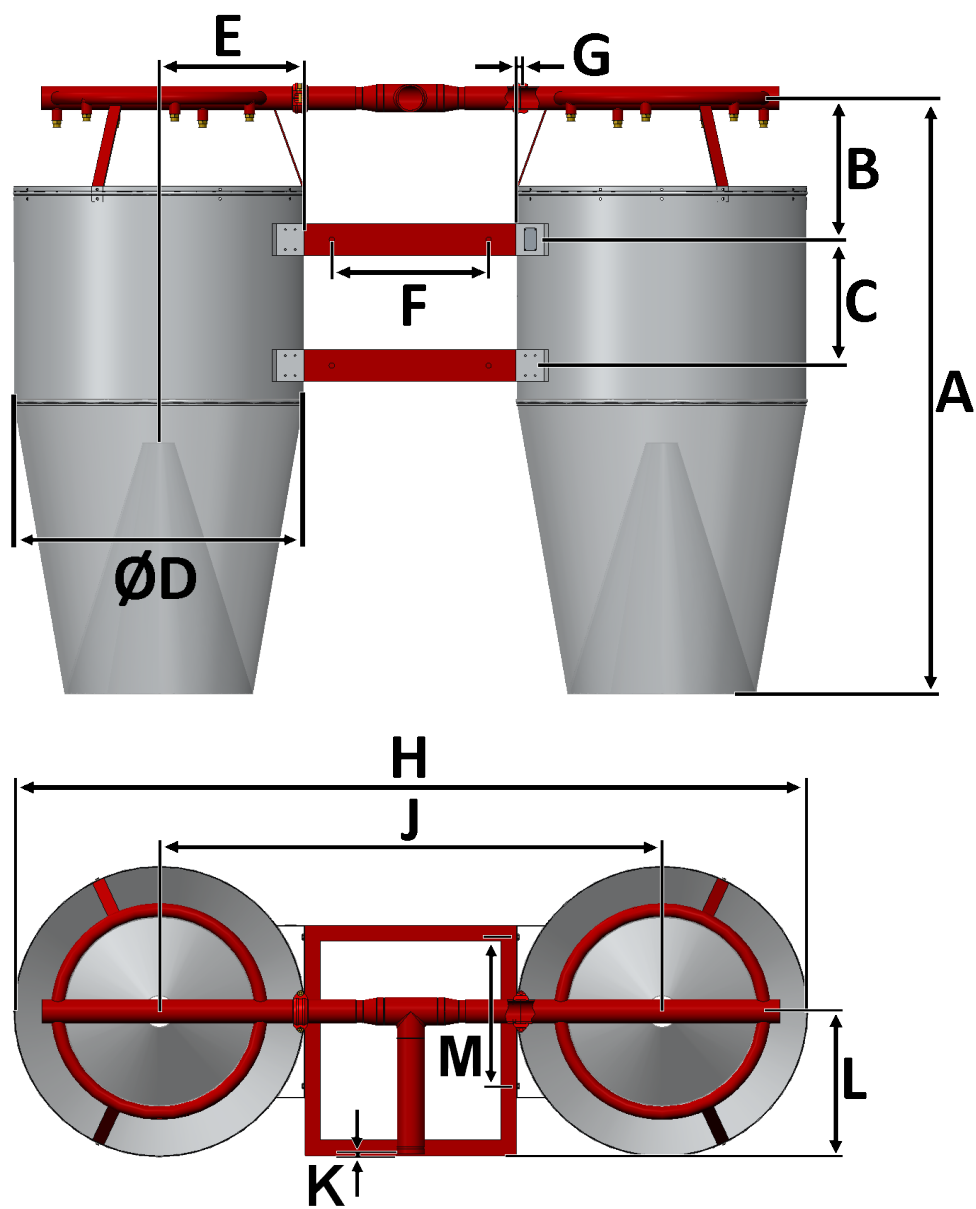


Figure 6.2.1 - GH250-VDS, GH400-VDS & GH800-VDS dimensions



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Table 6.2.2 - Generator Dimensions

Dimension	GH250-VDS		GH400-VDS		GH800-VDS	
	Inches	mm	Inches	mm	Inches	mm
A	75.5	1,918	75.5	1,918	75.5	1918
B	17.7	450	17.7	450	17.7	450
C	15.8	402	15.8	402	15.8	402
D	36.4	925	36.4	925	36.4	925
E	18.3	464	18.3	464	18.2	462
F	-	-	-	-	19.7	500
G	0.55	14	0.55	14	0.55	14
H	-	-	-	-	99.4	2,525
J	-	-	-	-	63	1,600
K	-	-	-	-	0.59	15
L	18.2	462	18.2	462	18.2	462
M	18.7	475	18.7	475	18.7	475
Nozzle quantity	6		9		18	

Note: The GH250-VDS, GH400-VDS and GH800-VDS body and nozzle manifold share the same base dimensions.



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7. PERFORMANCE DATA

When planning, installing and commissioning high expansion foam systems it is extremely important to use system components that have been tested together. The link between high expansion generator and foam concentrate is very important, as the resulting data is essential in the design calculations of the system. Foam concentrate should also be compatible with the selected proportioning system and foam storage tank.

NOTICE

The following data is based on the generators and foam concentrates referenced in this data page working together at their certificated flow rates and pressures. Tests conducted without wind. Actual site conditions may produce different results.

7.1 Submergence height

The height of the building and storage is an important factor to consider during design. Both foam concentrates have been tested at heights exceeding 10 metres. Consideration shall be given in the system design calculation that the higher the submergence height then the higher the correction factor for foam collapse might be. Test data obtained independently of VdS Approval and CNPP Certificate.

Please contact your local Viking office for further information.

7.2 High expansion foam concentrate

The following foam concentrates are approved and tested in conjunction with the GH series aspirated high expansion foam generators detailed in this data page.

Table 7.2.1 – High Expansion Generators Approved for use with Specific Foam Concentrates

Foam concentrate ⁷	Type	VdS ¹	CNPP APSAD T12 ²	EN1568 Certification			
				Part 1 ³	Part 2 ⁴	Part 3 ⁵	Part 4 ⁶
Viking xMax 3%	Synthetic Fluorine Free	yes	yes	yes	yes	yes	no
Viking eMax 3%	Synthetic Fluorine Free	yes	yes	no	yes	yes	yes

- 1) VdS Approval for generator with designated Foams to EN13565-2. Foam concentrate is not approved to VdS 3124.
- 2) GH400-VDS only tested on Class B liquid fires. Polar solvent (Acetone) and Hydrocarbon (Heptane). Details on request.
- 3) Part 1 = Medium expansion foam concentrates for surface application to water-immiscible liquids (hydrocarbons)
- 4) Part 2 = High expansion foam concentrates for surface application to water-immiscible liquids (hydrocarbons)
- 5) Part 3 = Low expansion foam concentrates for surface application to water-immiscible liquids (hydrocarbons)
- 6) Part 4 = Low expansion foam concentrates for surface application to water-immiscible liquids (polar solvents)
- 7) Please refer to foam concentrate data page or product sheet for detailed technical information

7.3 Expansion performance

During system design and planning, the performance data found in **sections 7.3.1 to 7.3.2** will be required to select the most suitable generator size and quantity. The cubic metre per minute (CMM) is required to complete the formula in VdS 2108 C6.4.1. Select the foam type required from **Table 7.2.1** to get the specific CMM for each foam/generator type/inlet pressure combination.



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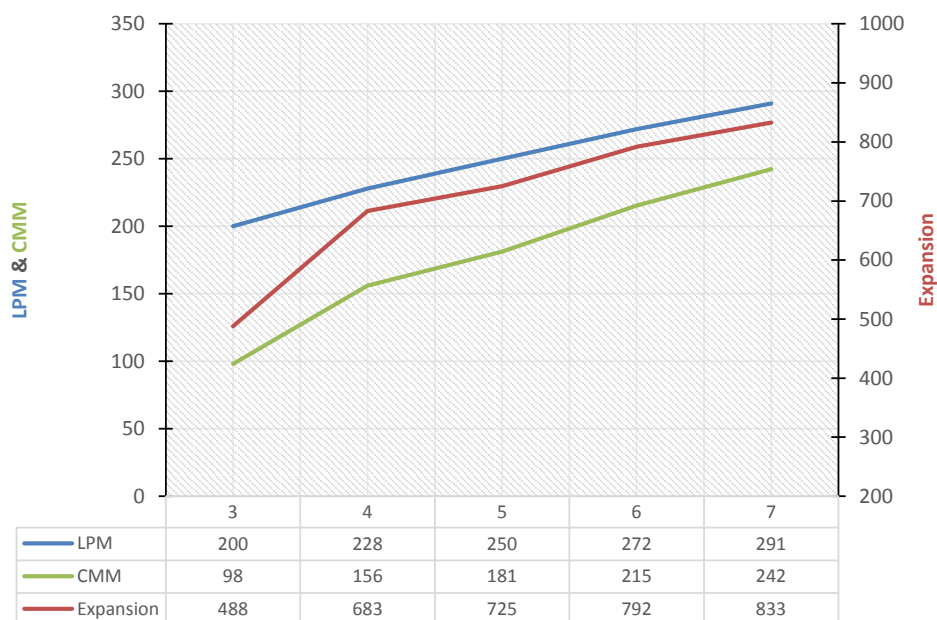
7.3.1 Performance data – Viking xMax 3% foam concentrate

Table 7.3.1.1 - Performance Data with Viking xMax Foam @ 3%

Model	psi	US GPM	CFM	bar	LPM	CMM	Expansion
GH250-VDS	43	53	3486	3	200	98	488
GH250-VDS	58	60	5562	4	228	156	683
GH250-VDS	72	66	6473	5	250	181	725
GH250-VDS	87	72	7694	6	272	215	792
GH250-VDS	101	77	8657	7	291	242	833
GH400-VDS	29	75	5,021	2	284	141	495
GH400-VDS	43	91	6,623	3	346	185	536
GH400-VDS	58	101	8,486	4	382	238	622
GH400-VDS	72	112	10,499	5	423	294	695
GH400-VDS	87	122	12,513	6	461	350	760
GH400-VDS	101	129	13,814	7	489	387	791
GH800-VDS	29	150	10,041	2	568	281	495
GH800-VDS	43	183	13,247	3	692	371	536
GH800-VDS	58	202	16,972	4	764	475	622
GH800-VDS	72	224	20,999	5	846	588	695
GH800-VDS	87	244	25,026	6	922	701	760
GH800-VDS	101	258	27,629	7	978	774	791

Note: Data extrapolated from tests with clean air (without fire) from within the test room at an ambient temperature of 10°C

Graph 7.3.1.2 - GH250 with Viking xMax Foam



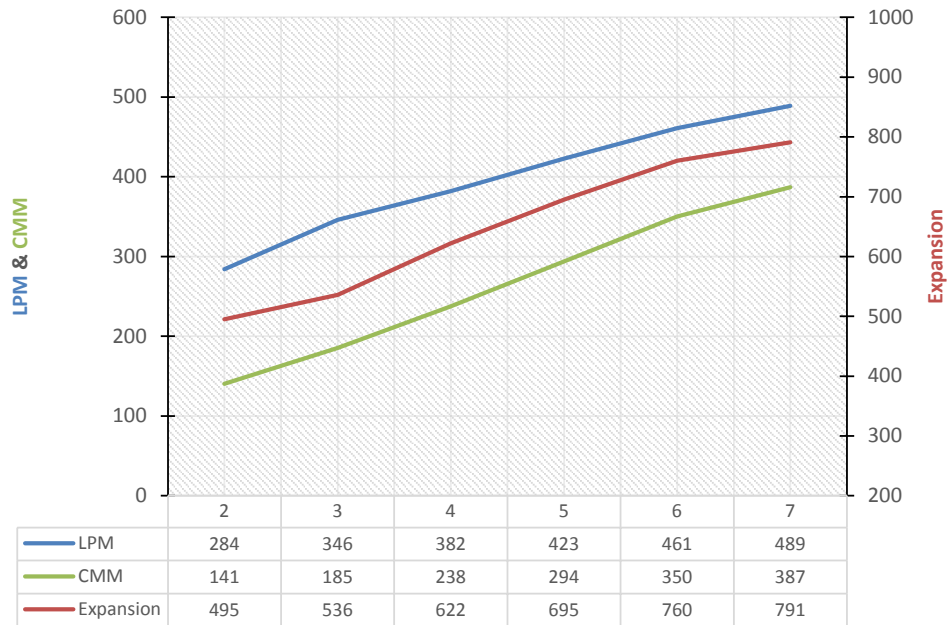


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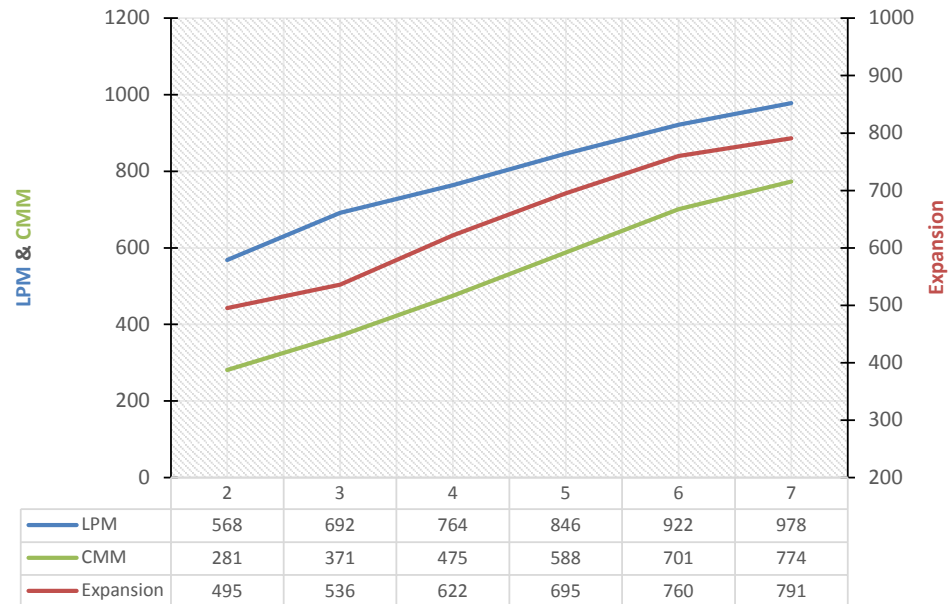
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Graph 7.3.1.3 - GH400 with Viking xMax Foam



Graph 7.3.1.4 - GH800 with Viking xMax Foam





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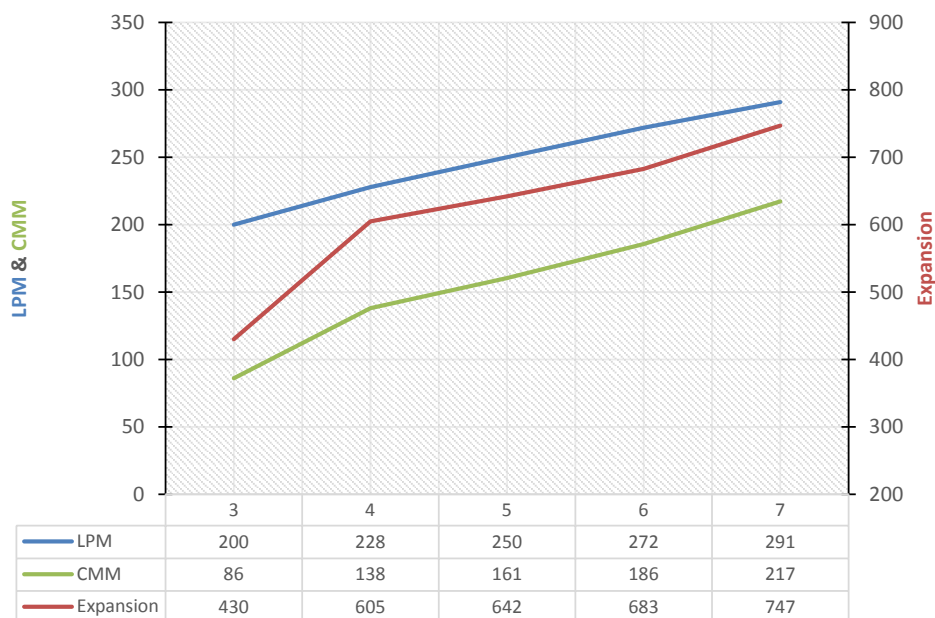
7.3.2 Performance data – Viking eMax 3% foam concentrate

Table 7.3.2.1 - Performance Data with Viking eMax Foam @ 3%

Model	psi	US GPM	CFM	bar	LPM	CMM	Expansion
GH250-VDS	43	53	3,071	3	200	86	430
GH250-VDS	58	60	4,926	4	228	138	605
GH250-VDS	72	66	5,732	5	250	161	642
GH250-VDS	87	72	6,635	6	272	186	683
GH250-VDS	101	77	7,763	7	291	217	747
GH400-VDS	29	75	3,530	2	284	99	348
GH400-VDS	43	91	5,375	3	346	151	435
GH400-VDS	58	101	6,835	4	382	191	501
GH400-VDS	72	112	7,780	5	423	218	515
GH400-VDS	87	122	8,874	6	461	248	539
GH400-VDS	101	129	9,588	7	489	268	549
GH800-VDS	29	150	7,059	2	568	198	348
GH800-VDS	43	183	10,751	3	692	301	435
GH800-VDS	58	202	13,670	4	764	383	501
GH800-VDS	72	224	15,560	5	846	436	515
GH800-VDS	87	244	17,749	6	922	497	539
GH800-VDS	101	258	19,176	7	978	537	549

Note: Data extrapolated from tests with clean air (without fire) from within the test room at an ambient temperature of 10°C

Graph 7.3.2.2 - GH250 with Viking eMax Foam



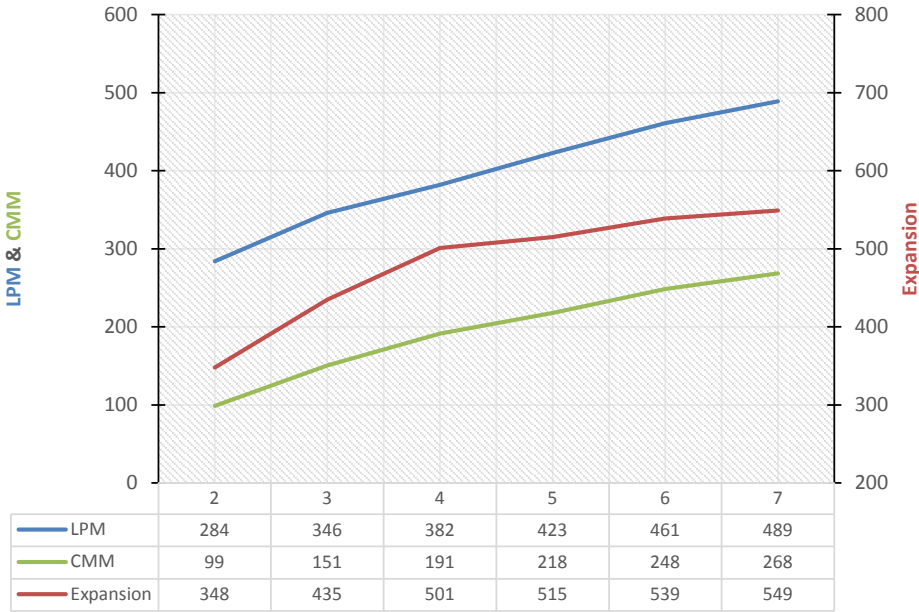


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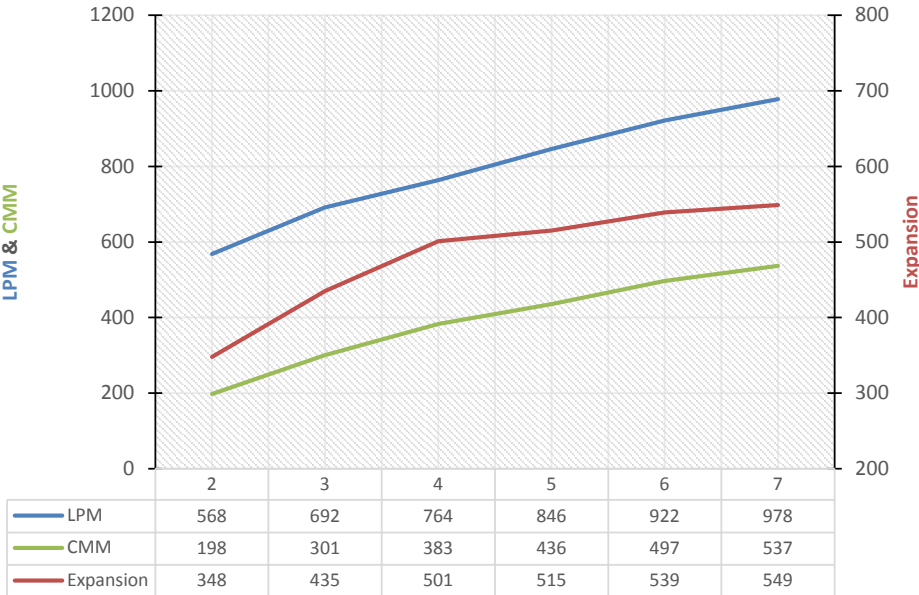
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Graph 7.3.2.3 - GH400 with Viking eMax Foam



Graph 7.3.2.4 - GH800 with Viking eMax Foam





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8. INSTALLATION

Refer to the respective requirements of VdS 2018 and / or EN13565-2.

In addition, the "Authority Having Jurisdiction" (AHJ) may have additional installation requirements that must be followed. Some key requirements are detailed in this section. For additional information, please refer to **Operation & Maintenance Manual TM1.3.4.24**

8.1 Position

The high expansion generator can be installed in the vertical or horizontal position.

8.2 Air supply to generator

In accordance with VdS 2108:2018-01 the air supply for the aspirating type high expansion generator should be taken from outside the risk area to avoid heat and smoke effected air influencing the foam quality and volume during a fire condition. Care should be taken to ensure adequate venting of air from inside the protected area when supplying the generator with fresh air from outside the protected area. Use of air from inside the protected area may also be possible subject to the requirements of VdS 2108:2108-01 and authorization of the AHJ or building owner.

8.3 Strainer

It is still good practice to ensure the water foam solution fed into the nozzle manifold during operation is free of debris. For this reason, we recommend a system or individual generator strainer with screen size of 4-5 mm.

8.4 Detection

High expansion foam systems should be activated quickly after the onset of fire, so suitable detection and release systems need to be provided. Please refer to the specific detection requirements outlined in the current version of VdS 2108. Detection via heat activated bulbs or links such as sprinklers shall not be used due to the inherent delay of operation.

9. OPERATION

High expansion foam generators are part of a fixed fire protection system incorporating a water supply, system pipework, foam concentrate, foam storage tank and proportioning / admixing system.

In a fire condition, the detection system will activate and sound the warning alarms. The deluge or flow control system(s) will then be opened via a releasing panel working in conjunction with the detection system. It is generally accepted that this delay will be around 30 seconds, giving time for activation before the discharge begins. Once the deluge or flow control valve is in operation, the incoming water supply is mixed with the foam concentrate using a proportioning / admixing system thereby creating foam solution. Once the system pipework has filled and is up to the required pressure – high expansion foam discharge will begin.

The protected area will be filled within a certain submergence time which is defined during the planning/design phase. The high volume of foam is design to suffocate the fire resulting in suppression or extinguishment. The submergence volume should be maintained as per the applicable design rules applied.

Once the fire is extinguished, the high expansion foam can be left to break down naturally or for a quicker cleanup, a fine hose spray can be employed to break down the bubbles. It is recommended to add an "Anti-foam" compound to the resulting foam solution to assist with the collection and transfer of the foam solution to prevent agitation and re-foaming.

10. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.



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11. INSPECTION, TESTS AND MAINTENANCE

Refer to respective requirements of VdS 2108 and/or EN13565-2. In addition, the “Authority Having Jurisdiction” (AHJ) may have additional maintenance, testing and inspection requirements that must be followed.

For manufacturer’s recommendations and requirements, please refer to **Operation & Maintenance Manual TM1.3.1.24**.

NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition.

WARNING

Any system maintenance or testing that involves placing a control valve or detection system out of service may eliminate the fire protection capabilities of that system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

12. DISPOSAL



At end of use the product described here should be disposed of via the national recycling system.

13. ACCESSORIES AND SPARE PARTS

Table 13.1.1 - Accessories

Part number	Description	Size
YSG-0250-076	Generator grooved strainer	2.5" (76.1 mm) grooved
YSG-0300	Generator grooved strainer	3" (88.9 mm) grooved
V-LSXMAX3/25	Viking xMax 3% foam concentrate	25 litre
V-LSXMAX3/200	Viking xMax 3% foam concentrate	200 litre
V-LSXMAX3/1000	Viking xMax 3% foam concentrate	1000 litre
V-LSEMAX3/25	Viking eMax 3% foam concentrate	25 litre
V-LSEMAX3/200	Viking eMax 3% foam concentrate	200 litre
V-LSEMAX3/1000	Viking eMax 3% foam concentrate	1000 litre
DEFOAM/SB/25	Anti-foam	25 litre
DEFOAM/SB/200	Anti-foam	200 litre
DEFOAM/SB/1000	Anti-foam	1,000 litre
849266	PicoFix model 900 rigid pipe coupling	3" OD (76.1 mm)
849267	PicoFix model 900 rigid pipe coupling	3" (88.9 mm)
UG3/4OT	Replacement nozzle	3/4"
844653	Galvanised strainer (course sieve)	3" (88.9 mm) grooved
844652	Galvanised strainer (fine sieve)	3" (88.9 mm) grooved
844655	Galvanised strainer (course sieve)	4" (114.3 mm) grooved
844654	Galvanised strainer (fine sieve)	4" (114.3 mm) grooved
844657	Galvanised strainer (course sieve)	6" (168.3 mm) grooved
844656	Galvanised strainer (fine sieve)	6" (168.3 mm) grooved
844659	Galvanised strainer (course sieve)	8" (219.1 mm) grooved
844658	Galvanised strainer (fine sieve)	8" (219.1 mm) grooved

Note: Strainers are optional accessories and do not form part of this VdS Approval for High Expansion Generators

14. DECLARATION OF CONFORMITY

If required. Contact the appropriate Viking sales office in **Section 5 Availability** for further assistance.