



## TECHNICAL DATA

### HANDLINE EDUCTOR MODEL FE90

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  
 Visit the Viking website for the latest edition of this technical data page.

## 1. GENERAL DESCRIPTION

The Viking Model FE90 Handline Eductors are an inexpensive foam proportioning device which use the Venturi effect to mix the correct amount of Foam Concentrate into the water supply, creating a Foam/Water solution. The Handline Eductors control the rate of mixture at 1%, 3%, or 6% using an internal metering orifice. Other than flowing water, no external power supplies are required to operate Handline Eductors.

The foam used with the Handline Eductors can be stored in pails, drums, or IBC totes, or any other listed or approved storage container. The Eductor consists of a Brass Body with brass internal nozzles, 1/2" brass check valve, a 1/2" pickup tube, strainer, and NPT X NHT adapters, for use with 1-1/2" hose handlines. The Foam Concentrate inlet is 1/2" NPT and includes a metering orifice sized for the application selected.

The Viking Handline Eductors operate as low as 50 PSI to a maximum of 200 PSI depending on available water supply. See Ordering Information below.



**WARNING:** Cancer and Reproductive Harm-  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

## 2. LISTINGS AND APPROVALS

The Viking Handline Eductor is UL Listed as part of a fire extinguishing system combining designated foam concentrates and discharge devices. Listed system components can be found at [www.database.UL.com](http://www.database.UL.com)



UL Listed - GHXV.EX5002 (UL162)

Other International approval certificates may be available upon request.

## 3. TECHNICAL DATA

### 3.1 Construction Features

- All brass construction
- Standard NPT Thread Connections
- UL Listed with a wide range of Foam Concentrates

### 3.2 Standard Materials

Table 3.2.1 - Standard Materials	
Brass Version	
Body	Cast Brass UNS-C84400
Orifice	Brass UNS-C46400
Retaining Rings	Stainless Steel
Nozzle	Brass UNS-C46401
Check Valve	Brass
Dip Tube 1/2"	Brass UNS-C26000
Dip Tube Strainer	Nylon and Stainless Steel
Pick-Up Tubing 1/2"ID (60" / 1.52m long)	Steel Reinforced Clear PVC Flexible Tube
Adaptors 1-1/2" NPT x NHT	Brass ASTM B62



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### 3.3 Standard Design Specifications

**Table 3.3.1 - Standard Design Specifications**

Model	Part Number	Listed for Use With (Foam Concentrate)	Maximum Inlet Pressure (PSIG)	Minimum Inlet Pressure (PSIG)	Maximum Pressure (%of Inlet)	Maximum Flow GPM (LPM)	Minimum Flow GPM (LPM)
FE90	F20963	FP 3% UL	200	50	65	95 (360)	78 (295)
	F20964	FP 6% UL					
	F20961	ARC 3X3S					
	F20962	AFFF 1% Ultra LT					
	F09181	AFFF3%S					

**Table 3.3.2**

Model	K-factor Water	K-factor 1%	K-factor 3%	K-factor 6%	Listings and Approvals
FE90	6.39	xxx	6.73	7.15	Refer to UL Online Guide for Listing requirements

### 3.4 Ordering Information

**Table 3.4.1 - Ordering Information**

Model	Part Number	Orifice Size	Orifice Part Number	Foam Concentrate
FE90	F20963	.202	F20966	FP 3% UL
	F20964	.276	F20967	FP 6% UL
	F20961	.245	F20968	ARC 3X3S
	F20962	.098	F20969	AFFF 1% Ultra LT
	F09181	.208	F09195	AFFF3%S

## 4. SCOPE OF DELIVERY

Ensure that all components are complete and in good condition.

Viking FE90 Handline Eductors are supplied with a metering orifice and nozzle configuration based upon the information received at order stage. Also supplied is Pick-Up Tube with Check Valve.

## 5. AVAILABILITY

Please contact Viking for further information.

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

**EMEA: Viking SA**, ZI Haneboesch, L-4562 Differdange / Niederkorn, Tel.: +352 58 37 37 - 1, Fax: +352 38 37 36, vikinglux@viking-emea.com

**Americas: The Viking Corporation**, 210 N. Industrial Park Drive, Hastings, Michigan 49058, Toll free phone: (800) 968-9501

**APAC: The Viking Corporation (Far East) Pte. Ltd.**, 69 Tuas View Square, Westlink Techpark, Singapore 637621  
 Tel: (+65) 6 278 4061, Fax: (+65) 6 278 4609, Email: vikingsingapore@vikingcorp.com



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## 6. PRODUCT VARIANTS

### 6.1 Dimensions and Equivalent Length

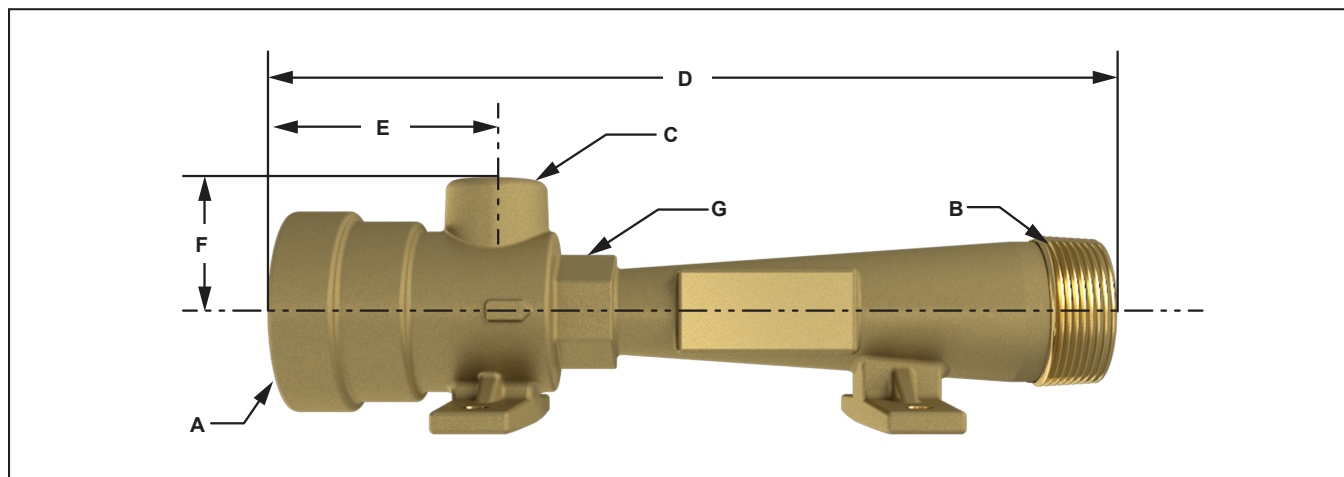


Table 6.2.1 - Dimensions

Part No.	A*	B*	C*	D	E	F	G
FE90	1-1/2" NPT	1-1/2" NPT	1/2" NPT	10.0" (25.4 cm)	2.5" (6.4 cm)	1.63" (4.1 cm)	-

\* The information given does not include the NHT adapters.

## 7. INSTALLATION

THE FOLLOWING INSTALLATION AND OPERATING PARAMETERS ARE CRITICAL FOR PROPER OPERATION OF FOAM EDUCTORS:

- 1: Inlet pressure must meet the minimum and maximum pressures indicated in table 3.3.1 for proper flow.
- 2: Back pressure at the outlet of eductor must not exceed 65% of the inlet pressure, or the eductor will not draw adequate foam concentrate, resulting in a lower percent concentration than desired of foam/water solutions.
- 3: The discharge devices must be capable of flows equal to those of the eductor, at pressures which will maintain the back pressure at 65% or less of the inlet pressure.
- 4: Causes for improper operation of eductors include:
  - a. Wrong flow rate discharge devices
  - b. Kink in discharge hose or bad lining
  - c. Nozzle shut down
  - d. Pick up tube plugged
  - e. Discharge device elevated to high
  - f. Discharge hose too long
- 5: Flush eductor out with clean water after use with foam.
- 6: The eductor has a fixed orifice for the % of foam educted and must match foam being utilized.

## 8. OPERATION

The Viking Foam Eductor for Handline Applications is a venturi type proportioning device which has the ability to draw foam concentrate into the eductor, without the need for a foam pump. The primary inlet (A) of the eductor (see Figure 6.2), includes a reduced diameter nozzle which causes an increase in the velocity of flowing water, thereby creating a negative pressure at the foam concentrate inlet, allowing atmospheric pressure to force foam concentrate from the storage container, through the pick-up tube and tubing, and into the eductor. The foam concentrate then passes through a metering orifice, and is proportioned with the flowing water at the desired percentage usually 1%, 3% or 6%.

The Viking Foam Eductor is intended for use with hose lines for the application of foam directly on the hazard, and should be used only with the listed nozzles where approved equipment is required.

The use of non-approved nozzles with the Viking Foam Eductor may result in the generation of a sub-standard quality foam/water solution which may not have the desired effect on the fire.



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## 9. GUARANTEE

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

## 10. INSPECTION, TESTS AND MAINTENANCE

Refer to respective requirements, according to the relevant standards for Inspection, Testing and Maintenance. If applicable, refer to FM Global Property Loss Prevention Datasheet 4-12 for specific test and commissioning criteria. In addition, the "Authority Having Jurisdiction" (AHJ) may have additional maintenance, testing and inspection requirements that must be followed.

### NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to recognized standards such as those produced by NFPA, LPC, and VdS which describe care and maintenance of sprinkler systems. In addition, the «Authority Having Jurisdiction» may have additional maintenance, testing and inspection requirements which must be followed.

### ⚠ WARNING

Any system maintenance or testing that involves placing a control valve or detection system out of service may eliminate the fire protection 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.

## 11. DISPOSAL



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

## 12. ACCESSORIES AND SPARE PARTS

None.

## 13. DECLARATION OF CONFORMITY

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