VIKING®

DESIGN DATA

MODEL LFF IN LINE BALANCED PRESSURE PROPORTIONER

1. PRODUCT NAME

Viking Model LFF In Line Balanced Pressure Proportioner
3" (80mm), 4" (100mm),
6" (150mm), 8" (200mm)
Manufactured 1996-

2. MANUFACTURER

THE VIKING CORPORATION
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3. PRODUCT DESCRIPTION

The Viking In Line Balanced Proportioner (ILBP) is a foam proportioning device which is used to balance the higher foam pressure to the lower water pressure on a Viking Low Flow Foam System. The device comes equipped with a balanced spool type balancing valve, brass swing check valve, duplex gauge which indicates both water pressure (black needle) and foam pressure (red needle), flexible braided sensing lines, and the interconnecting brass nipples as indicated on the detailed drawings.

4. TECHNICAL DATA

UL Listed Section Guide Number GHXV, Listing Number 4P09.
Passed the FM testing, waiting on final approval.
Please note that this device is a required component of the Viking Low Flow Foam System, and has been tested and approved for system applications using the Viking Low Flow Foam System and 3M Foam Concentrates shown in Figure 1. This device has also passed UL & FM Testing for use with Foam Pump Systems and final approvals are pending. Refer to Figures 1 & 2 for flow information.

5. OPERATION

The system water pressure, under a water flow condition, must be at least 15 psi lower than the foam concentrate pressure at proportioner. The reduction in system water pressure for a Viking Low Flow Bladder Tank System is accomplished by the use of the Viking Pilot Pressure Regulating Valve, Model A-1, which is also a component of the Viking Low Flow Foam System. For foam pump systems, the foam pressure at the ILBP must be at least

15 PSI higher than the water pressure. Upon actuation of a sprinkler head, water begins to flow through the system piping, including the Viking ILBP. The ILBP water sensing line connected up stream of concentrate controller (made by field) and foam sensing brass tubing line integral with the balancing valve, are connected to upper and lower side of internal hydraulic piston. The piston is integrally attached to balanced spool of pressure balancing valve. As the foam concentrate discharge pressure from spool valve increases above the inlet water pressure, the spool closes over discharge ports of balancing valve, until foam pressure equals water pressure, allowing the properly balanced pressure foam concentrate to flow through the metering orifice of the proportioner. As the discharge foam concentrate pressure is lowered below the water supply pressure due to increase in flow and metering pressure drop caused by venturi of proportioner, the piston and spool open to allow more flow as required. When the foam concentrate inlet pressure is equal to the water inlet pressure of the proportioner, the proper mixture of foam solution is developed at the minimum and maximum flow rates shown for each size ILBP and foam concentrate being applied. Due to the foam concentrate pressure being supplied at a higher pressure than the water supply, a positive injection of foam concentrate occurs. This will cause rich foam solution below the minimum flow rates shown or at the initial fire condition where one (1) or two (2) sprinklers open. As additional sprinklers operate and flow increases the metering pressure drop across venturi of proportioner matches the metering orifice sized for foam concentrate and proportioner thus producing the desired solution of water and foam mixture, (usually 3% or 6%) as indicated in Figure 1 and Figure 2.

6. APPLICATION

The Viking In Line Balancing Proportioner (ILBP), is currently listed for use on Viking Low Flow Foam Systems. It also has passed testing for use on foam pump systems.
Viking Low Flow Foam Wet Pipe Systems
Viking Low Flow Foam Dry Pipe Systems
Viking Low Flow Foam Preaction Systems
Viking Low Flow Foam Deluge Systems
The Viking Low Flow Foam System is recommended for:
1. Closed Head Wet Pipe Sprinkler
2. Closed Head Preaction Systems
3. Multiple Foam Discharge areas using a single foam concentrate source. Can combine wet pipe and deluge discharge systems
4. Variable discharge pressure at foam discharge devices or system

VIKING®

DESIGN DATA

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5. Variable system supply pressure allows for consistent and controlled discharge pressure conserving foam concentrate supply.
6. Multiple sizes of proportioning devices sized for hazard area using single foam concentrate source.

7. AVAILABILITY AND SERVICE

The Viking ILBP is available through a network of Domestic, Canadian, and International Distributors. See the Yellow Pages of the telephone directory for your closest distributor (listed under "Sprinklers Automatic Fire"), or contact The Viking Corporation.

8. GUARANTEES

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

9. INSTALLATION

(Refer to Figure 2 for identification of ILBP components.) **Note: On Viking Low Flow Bladder Tank Systems, the system flowing pressure at the discharge outlet of the Viking pressure regulating valve, must be set at a minimum of 15 psi lower than the system flowing pressure at the inlet to the Viking pressure regulating valve. (**Refer to the Viking Technical Data Book for instructions on how to adjust the outlet pressure on the Viking Pilot Operated Pressure Control Valve, Model A-1, under a flowing condition.) **For Foam Pump Systems, the foam concentrate pressure must be a minimum of 15 PSI higher than the system water pressure.**

9-a. General Instruction

The Viking ILBP is a pre-assembled proportioning device complete with a duplex water and foam pressure gauge, spool valve, concentrate controller, check valve, sensing lines and associated brass piping. It is an integral part of the Viking Low Flow Foam System, and must be installed in accordance with the following instructions. The Concentrate Controller (2) is installed in the riser, on the system side of the Viking Model A-1 Pressure Regulating Valve assembly (on Viking Low Flow Foam Bladder Tank Systems), usually between two flanges and a removable spool piece at least as long as the concentrate controller is. The spool piece makes it easier to service the concentrate controller, should that become necessary.

The ILBP unit is shipped with the foam pressure sensing line already installed at the end of the spool valve (1). The water sensing line must be field installed and a 1/4" water pressure tap must be provided by the installing contractor, upstream of concentrate controller approximately one (1) pipe diameter in riser. The foam concentrate supply line from the Viking Halar coated concentrate valve (D), is then connected to the inlet of the swing check valve (4), to complete the installation of the Viking ILBP. Refer to the appropriate Viking technical data pages for instructions as to completing the system installation and testing of the Low Flow Foam System.

10. INSPECTIONS AND TESTS

Refer to the applicable Viking foam system technical data pages for instructions on Inspections and Testing of the complete foam system.

11. MAINTENANCE

Refer to the applicable Viking foam system technical data pages for instructions on Maintenance of the complete system.

VIKING®

DESIGN DATA

MODEL LFF IN LINE BALANCED PRESSURE PROPORTIONER

Figure 1
VIKING ILBP
VIKING FOAM CONCENTRATE

SIZE	ILBP MODEL NO.	PART NO.	VIKING FOAM CONCENTRATE	FLOW @ GPM/LPM ALLOWABLE SOLUTION TOLERANCE		% SOLUTION
				GPM	LPM	
3"	LFF-V3W-125A	F01597A	VF1AFFF	100/582	378/2203	1%
	LFF-V3W-125B	F01597B	VF3AFF	100/620	378/2347	3%
	LFF-V3W-125C	F01597C	VF3AFFF-MS	130/625	492/2366	3%
	LFF-V3W-125D	F01597D	VF3ARC	152/620	575/2347	3%
	LFF-V3W-125J	F01597E	SUPREME3-ARC	75/630	284/2385	3%
4"	LFF-V4W-150A	F01598A	VF1AFFF	350/1160	1325/4391	1%
	LFF-V4W-150B	F01598B	VF3AFFF	150/1175	568/4447	3%
	LFF-V4W-150C	F01598C	VF3AFFF-MS	150/1230	568/4656	3%
	LFF-V4W-150D	F01598D	VF3ARC	199/1200	753/4542	3%
	LFF-V4W-150J	F01598E	SUPREME3-ARC	150/1200	568/4542	3%
6"	LFF-V6W-200A	F01599A	VF1AFFF	690/2700	2612/10219	1%
	LFF-V6W-200B	F01599B	VF3AFFF	150/2475	568/9368	3%
	LFF-V6W-200C	F01599C	VF3AFFF-MS	150/2500	568/9462	3%
	LFF-V6W-200D	F01599D	VF3ARC	405/2510	1533/9500	3%
	LFF-V6W-200J	F01599E	SUPREME3-ARC	498/2350	1885/8895	3%
8"	LFF-V8W-201A	F01600A	VF1AFFF	N/A	N/A	1%
	LFF-V8W-201B	F01600B	VF3AFFF	600/3000	2271/11355	3%
	LFF-V8W-201C	F01600C	VF3AFFF-MS	600/3000	2271/11355	3%
	LFF-V8W-201D	F01600D	VF3ARC	725/3209	2744/12146	3%
	LFF-V8W-201J	F01600E	SUPREME3-ARC	1530/*	5791/*	3%

*** -** Maximum flow not determined to date. Maximum flow witnessed by U.L. & F.M. was 3000 GPM. Maximum flow anticipated to be 5000 GPM.

Note: At flows below minimums indicated above, foam/water solution increases to approximately 4% to 5% upon initial system operation of closed head sprinkler system. When system flows fall within the flow at allowable solution tolerance, the foam/water solution will range from 3% to 3.9% for 3% solutions, and 6% to 7% for 6% solutions.

VIKING®

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Figure 2
VIKING ILBP
3M FOAM CONCENTRATE

SIZE	ILBP MODEL NO.	PART NO.	3M FOAM CONCENTRATE	FLOW @ GPM/LPM ALLOWABLE SOLUTION TOLERANCE		% SOLUTION
				GPM	LPM	
3"	LFF-V3W-125A	F01597A	FC201F	100/582	378/2203	1%
	LFF-V3W-125B	F01597B	FC783F	100/620	378/2347	3%
	LFF-V3W-125C	F01597C	FC203CF	130/625	492/2366	3%
	LFF-V3W-125D	F01597D	FC603F	152/620	575/2347	3%
	LFF-V3W-125J	F01597E	ATC603	75/630	284/2385	3%
4"	LFF-V4W-150A	F01598A	FC201F	350/1160	1325/4391	1%
	LFF-V4W-150B	F01598B	FC783F	150/1175	568/4447	3%
	LFF-V4W-150C	F01598C	FC203CF	150/1230	568/4656	3%
	LFF-V4W-150D	F01598D	FC603F	199/1200	753/4542	3%
	LFF-V4W-150J	F01598E	ATC603	150/1200	568/4542	3%
6"	LFF-V6W-200A	F01599A	FC201F	690/2700	2612/10219	1%
	LFF-V6W-200B	F01599B	FC783F	150/2475	568/9368	3%
	LFF-V6W-200C	F01599C	FC203CF	150/2500	568/9462	3%
	LFF-V6W-200D	F01599D	FC603F	405/2510	1533/9500	3%
	LFF-V6W-200J	F01599E	ATC603	498/2350	1885/8895	3%
8"	LFF-V8W-201A	F01600A	FC201F	N/A	N/A	1%
	LFF-V8W-201B	F01600B	FC783F	600/3000	2271/11355	3%
	LFF-V8W-201C	F01600C	FC203CF	600/3000	2271/11355	3%
	LFF-V8W-201D	F01600D	FC603F	725/3209	2744/12146	3%
	LFF-V8W-201J	F01600E	ATC603	1530/*	5791/*	3%

*** -** Maximum flow not determined to date. Maximum flow witnessed by U.L. & F.M. was 3000 GPM. Maximum flow anticipated to be 5000 GPM.

Note: At flows below minimums indicated above, foam/water solution increases to approximately 4% to 5% upon initial system operation of closed head sprinkler system. When system flows fall within the flow at allowable solution tolerance, the foam/water solution will range from 3% to 3.9% for 3% solutions, and 6% to 7% for 6% solutions.

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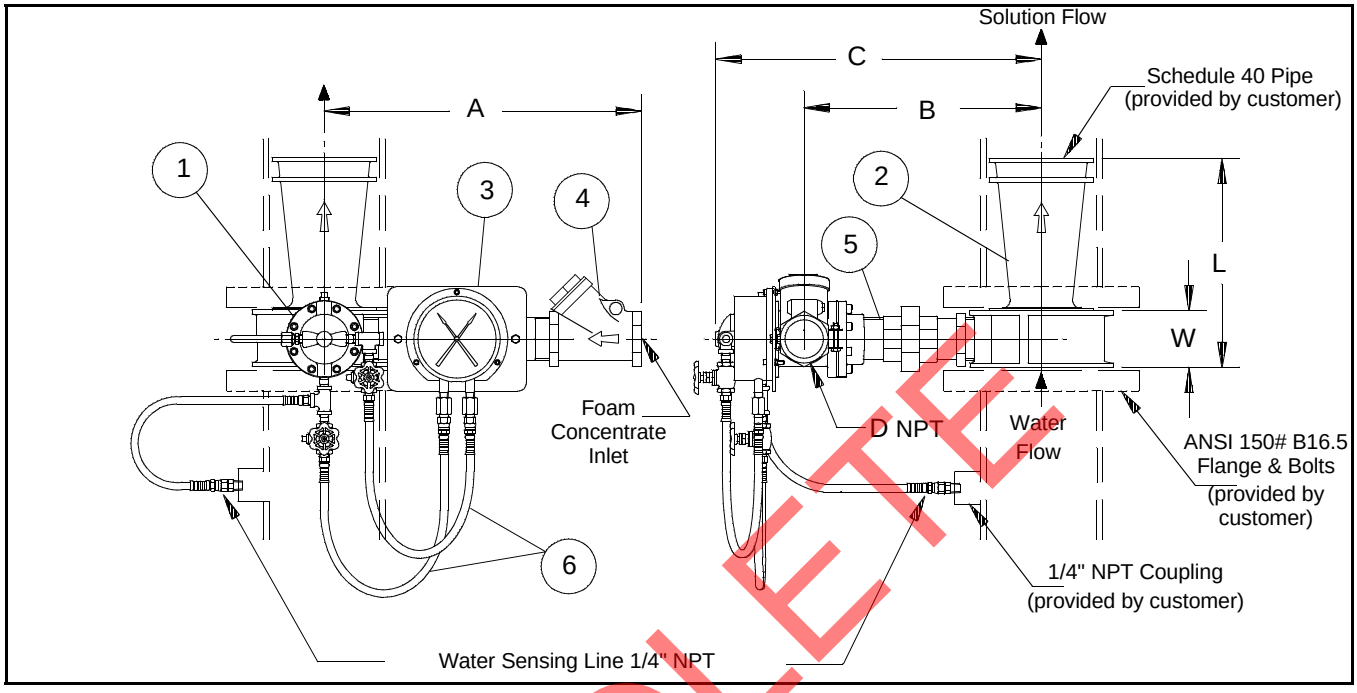

ILBP COMPONENTS
FIGURE 3

ITEM NO.	DESCRIPTION	MATERIAL
1	Spool Balancing Valve	UNS B844000 Brass & Stainless Steel Electroless Nickel Plated
2	Concentrate Controller	Brass
3	Duplex Pressure Gauge	Brass
4	Swing Check Valve	Brass
5	Concentrate Piping	Red Brass
6	Sensing Lines	TFE® Lined Stainless Steel Braided

DIMENSION TABLE

Nominal Pipe Size	A	B	C	D	E	F	L	W	WT.
3"	17-3/4	11-5/8	16-5/8	1-1/4	3 X 7-1/2	3"	6-1/8"	2-3/8	
4"	17-3/4	12-3/8	17-1/8	1-1/2	4 X 9	4"	8"	2-1/2	
6"	18-3/4	12-7/8	18-5/8	2"	6 X 11	6"	12"	3-1/4	
8"	18-3/4	15	20-3/4	2"	8 X 13-1/2	8"	12"	3-1/2	

NOTES

1. Foam concentrate inlet pressure must be minimum 15 PSI higher than water inlet pressure and max 50 PSI higher at Item 2.
2. Each ILBP shall include 4-5 pipe diameters of straight pipe unobstructed upstream and downstream of concentratecontroller (item 2).
3. ILBP may be installed vertical or horizontal.
4. Maximum foam inlet pressure, 200 PSI.
5. For hydraulic loss due to flow see Viking Foam Manual, page 856D.
6. Foam concentrate supply shall include a manual full port ball valve and Viking Model E-2 or H-2 Halar Deluge or Flow Control Valve for automatic operation. See system drawing for detail.
7. Foam concentrate line size may require being increased over inlet size "D" due to friction loss in piping from riser to foam source.
8. The Viking ILBP is UL Listed with FM Approval pending for use with the Viking Low Flow Foam System. See data sheet for system details.
9. A foam concentrate supply pressure gauge is recommended adjacent to inlet of connection "D".
10. If installed in a horizontal header, the check valve (item 4) must be oriented so that the clapper is perpendicular to the floor and access hole is facing up.