Foam System Line Proportioners

Application

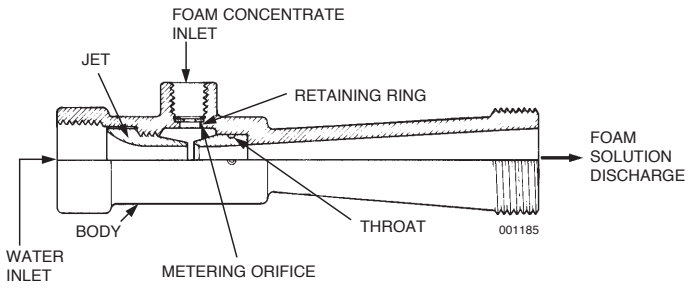
ANSUL® line proportioners are designed to introduce a controlled flow of foam concentrate into a pressurized water stream. They provide an inexpensive foam proportioning means for systems requiring fixed flow rates and where available water supply pressures are adequate.

Depending on specific foam systems design, line proportioners may operate with inlet pressures as low as 80 psi (5.52 bar). However, in most systems a water pressure between 125 psi and 200 psi (8.62 bar and 13.79 bar) is required. The flow rate and operating pressure required at the foam making device are of primary importance in determining the required line proportioner inlet pressure. The line proportioner must match the flow rate of the foam making discharge device.

ANSUL® model "PL" line proportioners can be used with all types of foam concentrates. The proportioners are available in a wide range of sizes for fixed foam system applications. These applications also require an atmospheric foam concentrate storage tank as shown in the Typical Line Proportioning System schematic.

Typical applications include use by municipal fire departments and CFR type vehicles, or with fixed systems for protecting flammable liquid storage tanks, loading racks, dike areas, and anywhere flammable liquids are used, stored, processed, or transported.

Line Proportioner Cross Section



001158

Description

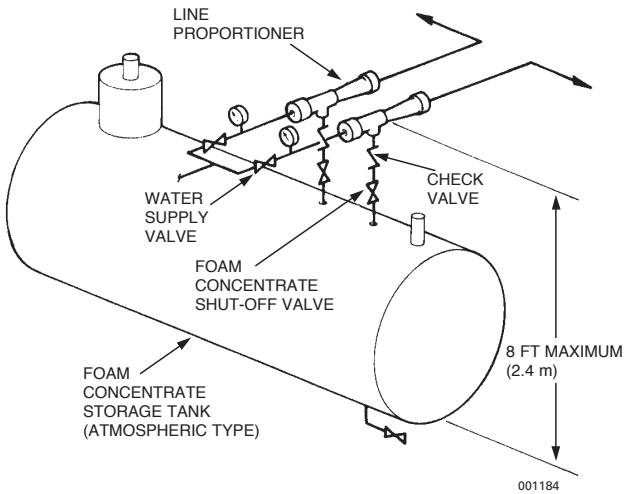
Each ANSUL® line proportioner consists of a body, jet, throat, and metering orifice – all of which are corrosion-resistant brass.

The line proportioner body is designed with a female NPT threaded inlet and a male NPT threaded outlet (see Line Proportioner Dimensions). The proportioner body is clearly marked with a flow direction arrow and the designed concentration percentage.

The inlet jet is secured by a stainless steel retaining ring on models PL-60 through PL-350; the inlet jet is threaded in place on models PL-420 through PL-730. The metering orifice or adjustable metering valve is sized according to the type and percentage of foam concentrate used. The metering orifice is secured with a stainless steel retaining ring to enable ease of change-over to other concentrate percentages.

In fixed systems, the line proportioner may be mounted at a maximum distance of 8 ft (2.4 m) above the minimum foam liquid surface.

Typical Line Proportioning System



One Stanton Street | Marinette, WI 54143-2542, USA | +1-715-735-7411 | www.ansul.com
 | Form No. F-8739-07

Specifications

The line proportioner body, jet, and throat shall be of brass construction. Retaining rings for both the inlet jet and the metering orifice shall be stainless steel.

The line proportioner body shall have a female NPT inlet and male NPT outlet (see Line Proportioner Dimensions). The body shall be clearly marked with a flow direction arrow and the percentage of foam concentrate that the proportioner was designed to provide.

The convergent inlet jet shall have a rounded inlet and a smooth machined finish to ensure minimum friction loss. It shall be retained by a stainless steel retaining ring or shall be threaded in place. The inlet jet shall terminate in the foam concentrate annulus chamber, and shall be concentric with and set back from the throat and pressure recovery section. Line proportioner outlet pressure recovery shall be 65% of the inlet pressure. The line proportioner shall be approved for mounting up to a maximum height of 8 ft (2.4 m) above the minimum foam liquid surface.

The foam concentrate metering orifice shall be machined to the proper diameter for the agent. It shall rest on a machined surface to prevent leakage and shall be secured by a removable stainless steel retaining ring.

K Factor Calculations

Flow Rate at Given Pressure

Line Proportioner Model	K Factor Water (No Proportioning)	K Factor 1%	K Factor 3%	K Factor 6%
PL-60	4.3	4.4	4.5	4.6
PL-95	6.7	6.8	7.0	7.1
PL-120	8.5		8.8	9.0
PL-210	15.3		15.9	16.2
PL-240	16.8		17.4	17.8
PL-280	20.2		21.0	21.5
PL-350	26.3		27.2	27.9
PL-420	32.1		33.2	34.1
PL-480	35.5		36.8	37.7
PL-550	41.8		43.3	44.4
PL-600	44.2		45.8	46.9
PL-660	50.1		51.9	53.2
PL-730	56.3		58.4	59.8

Formula: $Q = \left(K \sqrt{P} \right)$

Q = Flow Rate at specified pressure (gpm)
K = K Factor
P = Pressure (psi)

Example: Find flow of PL-350 @ 180 psi (12.41 bar) when used with a 3% foam concentrate:

PL-350 3% K Factor		27.2
Square root of 180 psi	X	13.42
FLOW RATE		365 gpm @ 180 psi (1382 Lpm @ 12.41 bar)

Installation Requirements

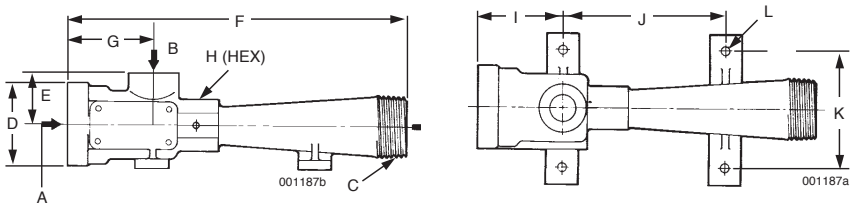
1. The line proportioner must not be mounted more than 8 ft (2.4 m) above the minimum foam concentrate liquid level as shown on Page 1.
2. Downstream pipe, fittings, elevation head, and discharge devices must not result in line proportioner outlet backpressure in excess of 65% of line proportioner inlet pressure. (Consult with the system designer to verify.)
3. A check valve must be installed in the foam concentrate line with the direction of flow from the foam concentrate storage tank to the line proportioner. (See Page 1.)
4. A shutoff valve in the foam concentrate line is recommended to enable flush out of foam solution piping or allow for water only discharge. (See Page 1.)
5. Piping to foam concentrate inlet must be sized to match the foam concentrate inlet piping size. (See Dimension B on next page.) A minimum of 5 nominal pipe diameters of straight pipe upstream of the line proportioner is recommended.
6. The foam concentrate inlet line should not exceed 11 ft (3.4 m) of pipe, two 90° elbows, one swing check valve, and one nonrestricting shutoff valve.

NOTICE

Exceeding foam concentrate line limitations or using pipe sizes smaller than the foam concentrate inlet of the line proportioner may reduce concentration percentages.

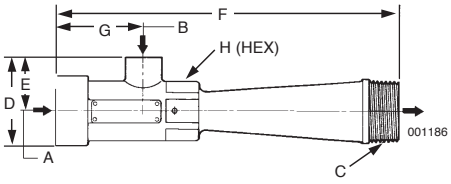
Line Proportioner Dimensions

Models PL-60 Through PL-350



Model	A NPT	B NPT	C NPT	D in. (mm)	E in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	I in. (mm)	J in. (mm)	K in. (mm)	L in. (mm)
PL-60	1 1/2 – 11 1/2	1/2 – 14	1 1/2 – 11 1/2	2.50 (63.5)	1.59 (40.4)	10.00 (254.0)	2.47 (62.7)	1.25 (31.8)	2.47 (62.5)	5.00 (127.0)	3.50 (88.9)	0.281 (7.14)
PL-95	1 1/2 – 11 1/2	1/2 – 14	1 1/2 – 11 1/2	2.50 (63.5)	1.59 (40.4)	10.25 (260.4)	2.63 (66.8)	1.38 (35.1)	2.63 (66.8)	5.00 (127.0)	3.50 (88.9)	0.281 (7.14)
PL-120	2 1/2 – 8	1/2 – 14	2 1/2 – 8	3.56 (90.4)	2.38 (60.5)	14.25 (362.0)	2.88 (73.2)	2.00 (50.8)	2.88 (73.2)	8.00 (203.2)	3.50 (88.9)	0.281 (7.14)
PL-210	2 1/2 – 8	1 – 11 1/2	2 1/2 – 8	3.75 (95.3)	2.69 (68.3)	16.00 (406.4)	4.25 (108.0)	2.63 (66.8)	4.25 (108.0)	8.50 (215.9)	4.00 (101.6)	0.343 (8.7)
PL-240	2 1/2 – 8	1 – 11 1/2	2 1/2 – 8	3.75 (95.3)	2.69 (68.3)	16.00 (406.4)	4.25 (108.0)	2.63 (66.8)	4.25 (108.0)	8.50 (215.9)	4.00 (101.6)	0.343 (8.7)
PL-280	2 1/2 – 8	1 – 11 1/2	2 1/2 – 8	3.75 (95.3)	2.69 (68.3)	16.00 (406.4)	4.25 (108.0)	2.63 (66.8)	4.25 (108.0)	8.50 (215.9)	4.00 (101.6)	0.343 (8.7)
PL-350	2 1/2 – 8	1 – 11 1/2	2 1/2 – 8	3.75 (95.3)	2.69 (68.3)	16.00 (406.4)	4.25 (108.0)	2.63 (66.8)	4.25 (108.0)	8.50 (215.9)	4.00 (101.6)	0.343 (8.7)

Models PL-420 Through PL-730



Model	A NPT	B NPT	C NPT	D in. (mm)	E in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)
PL-420	2 1/2 – 8	1 – 11 1/2	3 – 8	4.03 (102.4)	2.97 (75.4)	18.38 (466.9)	4.75 (120.7)	3.00 (76.2)
PL-480	2 1/2 – 8	1 – 11 1/2	3 – 8	4.03 (102.4)	2.97 (75.4)	18.38 (466.9)	4.75 (120.7)	3.00 (76.2)
PL-550	2 1/2 – 8	1 – 11 1/2	3 – 8	4.03 (102.4)	2.97 (75.4)	18.38 (466.9)	4.75 (120.7)	3.00 (76.2)
PL-600	3 – 8	1 1/4 – 11 1/2	4 – 8	4.38 (111.3)	3.21 (81.5)	20.19 (512.8)	5.06 (128.5)	3.25 (82.6)
PL-660	3 – 8	1 1/4 – 11 1/2	4 – 8	4.38 (111.3)	3.21 (81.5)	20.19 (512.8)	5.06 (128.5)	3.25 (82.6)
PL-730	3 – 8	1 1/4 – 11 1/2	4 – 8	4.38 (11.13)	3.21 (8.15)	20.19 (51.28)	5.06 (128.5)	3.25 (82.6)

NOTICE

Mounting feet are not provided with models PL-420 through PL-730.

Ordering Information

Line Proportioner Model	Part No. with 1% Concentrate Orifice	Part No. with 3% Concentrate Orifice	Part No. with 6% Concentrate Orifice	Approximate Shipping Weight lb	(kg)
PL-60	75653*	75650*	75656	7	(3.2)
PL-95	75663*	75662*	75668	7	(3.2)
PL-120		75674	75679	12	(5.4)
PL-210		75684	75689	19	(8.6)
PL-240		76890	76895	19	(8.6)
PL-280		75694	75699	19	(8.6)
PL-350		75704	75709	19	(8.6)
PL-420		71508	71504	24	(10.9)
PL-480		71518	71514	24	(10.9)
PL-550		71528	71524	24	(10.9)
PL-600		71538	71534	29	(13.2)
PL-660		71548	71544	29	(13.2)
PL-730		71558	71554	29	(13.2)

*UL Listed

Safety Data Sheet (SDS) available at www.ansul.com

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