

RATIO CONTROLLERS

MODEL RCF

NPR090

Approvals: UL, ULC

- Flanged For Ease Of Installation And Removal (ANSI Pattern)
- Water Pressure Sensing Port For Use In Balanced Pressure Systems
- Flow Ranges From 70 To 5000 GPM
- Percentage Can Be Fine Tuned On Site With Out Disassembly
- Seawater Compatible, Bronze Construction
- Simple/Reliable/No Moving Parts



Description

The Model RCF Ratio Controller is a cast brass proportioner with flanged connections, which is designed to inject foam concentrate into the water supply piping. It is compatible with all types of foam fire protection systems, and proportions all types of foam concentrates over their entire flow range without manual adjustments, regardless of pressure.

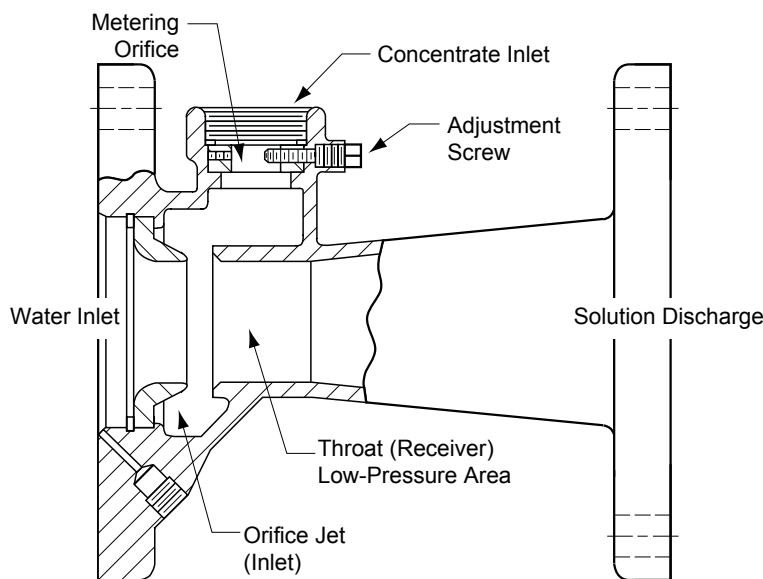
The ratio controller consists of three main components: the water orifice jet at the inlet of the ratio controller; the foam concentrate metering orifice located in the foam concentrate inlet; and the throat or receiver located downstream of the water jet. The

principle of operation is based on the use of a modified venturi proportioner commonly called a ratio controller. As water flows through the water jet, it creates a reduced pressure area between the jet and the receiver. This reduction in pressure creates a pressure differential across the foam concentrate metering orifice, causing the foam concentrate to flow into the low-pressure area. The foam concentrate is then drawn out of the low-pressure area and mixed with the water supply as it enters the receiver. As the water flow through the ratio controller jet increases, the pressure reduction increases, thereby creating a corresponding higher pressure differential across the foam

concentrate metering orifice. This increase in pressure differential results in an increase in the foam concentrate flow, which is proportionate to the water flow through the ratio controller. Proper proportioning is achieved simply by maintaining identical water and foam concentrate pressures at the respective inlets of the ratio controller.

Features

- The foam concentrate orifice has an adjustment feature, allowing the user to easily fine tune concentrate injection percentage in the field without disassembly.
- The integral water sensing port can be used for sensing water pressure and/or supplying water to water powered ball valves or other water operated control devices.
- Recovery section minimizes pressure loss through proportioner and reduces length of straight pipe required after the controller.
- Available in 1%, 2% (HI-EX[®]), 3%, or 6% injection models for specific foam concentrate proportioning needs, or a metering valve model for variable proportioning.
- Fits between two flanges and does not require special piping accommodations for removal after initial installation as with wafer style ratio controllers.
- May be installed in any position for versatility of system design.



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Features (cont.)

- Compatible with either fresh or salt water, as well as with all types of foam concentrates.

Applications

Ratio controllers are commonly used in bladder tank and in-line balanced pressure proportioning systems for aircraft hangars, loading racks, and sprinkler systems, as well as in marine applications, such as shipboard systems, docks, and offshore platforms.

Technical Specifications

The ratio controller (RCF) shall be a flange style and shall be designed to be mounted in schedule 40 pipe between two 150# flat or raised flanges of the same nominal size as the RCF. Body shall be ASTM-B-584 alloy #83600

cast bronze (85-5-5-5) with 300 series stainless steel hardware and shall be rated for a working pressure of 225 psi (16 bar). The ratio controller shall be hydrostatically tested to 375 psi (25.8 bar). The ratio controller shall incorporate a recovery section to minimize the pressure loss through the proportioner and reduce the straight pipe length required after the controller. A 1/4" (6.35 mm) female NPT port for sensing water pressure at the inlet to the ratio controller water orifice shall be incorporated into the casting. Each ratio controller shall automatically proportion over the range indicated on flow range chart without any manual adjustment. The foam concentrate inlet shall be female NPT and shall contain a foam concentrate metering orifice with field adjustment feature to allow user to fine tune proportioning flow to within the following proportioning tolerances:

Nominal Rate	Tolerance Range
1%	1% - 1.3%
2% (HI-EX®)	2% - 2.6%
3%	3% - 3.9%
6%	6% - 7%

Note: The 2% UL Listing applies only to HI-EX® Foam Concentrate for use with the 3", 4", and 6" ratio controllers.

Approvals and Listings

- UL Listed
- ULC Listed

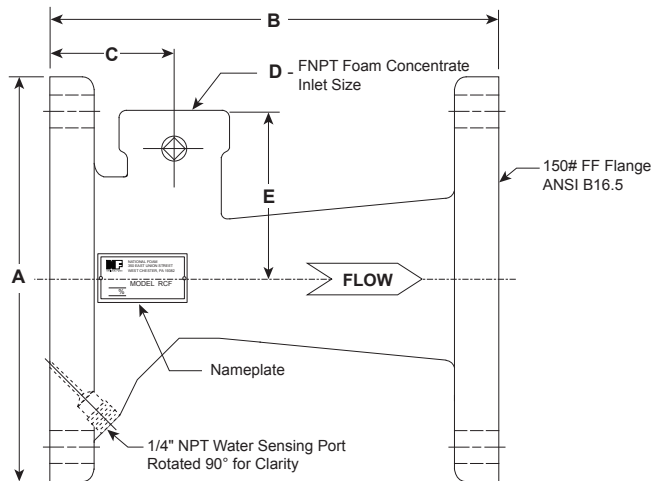
Technical Information

Materials of Construction:

Body: ASTM-B584 alloy #83600 cast bronze (85-5-5-5)
 Hardware: Stainless steel
 Finish: Standard brass finish as cast (no paint)

Optional Accessories

Variable proportioning metering valve



Notes:

- 1%, 2%, 3%, or 6% proportioning and type foam concentrate to be specified by customer.
- A minimum of five pipe diameters of straight unobstructed pipe is required upstream and downstream of each ratio controller.
- The piping to and from the ratio controller must be adequately supported so that no strain is imposed on the proportioner body.

RATIO CONTROLLER DIMENSION CHART

Model	Approximate Dimensions in (mm)					Weight lb (kg)
	A	B	C	D	E	
3" RCF	7-1/2 (191)	6-1/2 (165)	2 (51)	1-1/2	3 (76)	27 (12)
4" RCF	9 (229)	10 (254)	3 (76)	2	4 (102)	43 (20)
6" RCF	11 (279)	12-3/4 (324)	3-1/16 (78)	2-1/2	4-5/8 (117)	59 (27)
8" RCF	13-1/2 (343)	13-1/2 (343)	3-1/2 (89)	3	6-3/8 (162)	115 (52)

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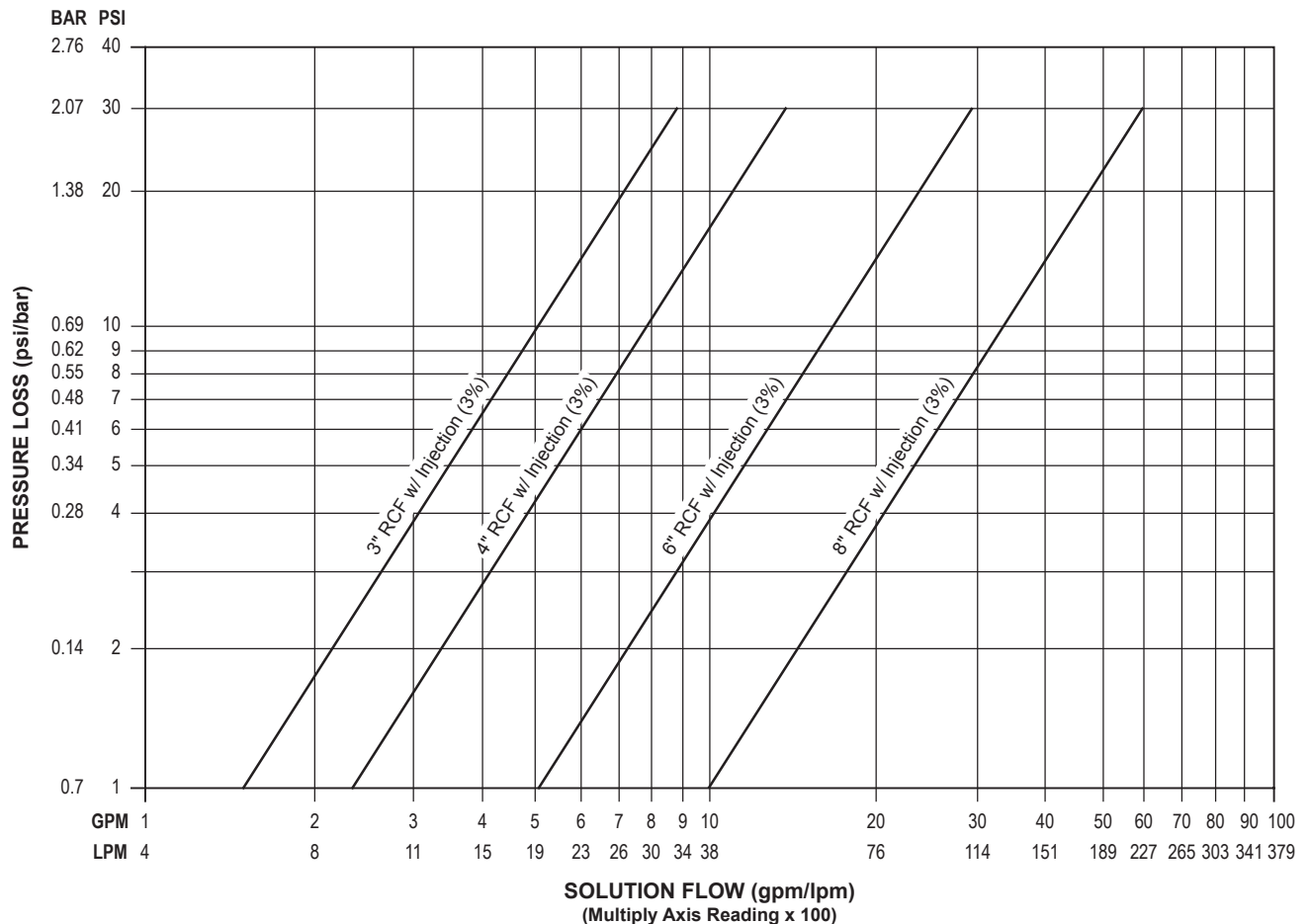
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RATIO CONTROLLER FLOW RANGE CHART

Type of Proportioning System	Flow Range in gpm (lpm)		
	Balanced Pressure (Pump Type)	In-line Balanced Pressure (Pump Type)	Bladder Tanks
Ratio Controller Size & Model	All Foam Concentrates 1, 3, or 6%	All Foam Concentrates Except AR-AFFF	3%-6% AR-AFFF
3" RCF	70-550 (265-2082)*	70-450 (265-1703)*	170-450 (644-1703)
4" RCF	60-1579 (227-5977)*	150-1200 (568-4542)*	320-1200 (1211-4542)
6" RCF	150-3298 (568-12484)*	300-2500 (1136-9463)*	700-2500 (2650-9463)
8" RCF	760-5000 (2877-18927)*	850-5000 (3218-18925)*	1400-5000 (5300-18927)

* Represents the overall flow range for all foam concentrates listed with respective ratio controller. Refer to UL directory for specific flow range for each foam concentrate.

RATIO CONTROLLER FOR BALANCED PRESSURE (BACK PRESSURE CONTROL) PROPORTIONERS PRESSURE LOSS PERFORMANCE DATA



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ORDERING INFORMATION						
Size	Model	% Injection	Foam Concentrate	Part Number	Weight lb (kg)	Approx. Shipping Cube ft ³ (m ³)
3"	RCF	for metering*		1233-7971-1	27 (12)	0.61 (0.017)
3"	RCF	1%	AFFF	1233-7971-9	27 (12)	0.61 (0.017)
3"	RCF	2%	HI-EX [®] 2%	1233-7970-9	27 (12)	0.61 (0.017)
3"	RCF	3%	P	1233-7971-2	27 (12)	0.61 (0.017)
3"	RCF	3%	AFFF	1233-7971-3	27 (12)	0.61 (0.017)
3"	RCF	3%	UG	1233-7971-6	27 (12)	0.61 (0.017)
3"	RCF	6%	AFFF	1233-7971-5	27 (12)	0.61 (0.017)
4"	RCF	for metering*		1233-7972-1	43 (20)	1.09 (0.031)
4"	RCF	1%	AFFF	1233-7973-9	43 (20)	1.09 (0.031)
4"	RCF	2%	HI-EX [®] 2%	1233-7972-7	43 (20)	1.09 (0.031)
4"	RCF	3%	P	1233-7972-2	43 (20)	1.09 (0.031)
4"	RCF	3%	AFFF	1233-7972-3	43 (20)	1.09 (0.031)
4"	RCF	3%	UG	1233-7972-4	43 (20)	1.09 (0.031)
4"	RCF	6%	AFFF	1233-7973-2	43 (20)	1.09 (0.031)
4"	RCF	6%	UCG-6	1233-7972-6	43 (20)	1.09 (0.031)
6"	RCF	for metering*		1233-7974-1	59 (27)	1.79 (0.051)
6"	RCF	1%	AFFF	1233-7975-9	59 (27)	1.79 (0.051)
6"	RCF	2%	HI-EX [®] 2%	1233-7974-9	59 (27)	1.79 (0.051)
6"	RCF	3%	P	1233-7974-2	59 (27)	1.79 (0.051)
6"	RCF	3%	AFFF	1233-7974-3	59 (27)	1.79 (0.051)
6"	RCF	3%	UG	1233-7974-4	59 (27)	1.79 (0.051)
6"	RCF	6%	AFFF	1233-7975-2	59 (27)	1.79 (0.051)
6"	RCF	6%	UCG-6	1233-7974-6	59 (27)	1.79 (0.051)
8"	RCF	for metering*		1233-7976-1	115 (52)	2.6 (0.074)
8"	RCF	1%	AFFF	1233-7977-9	115 (52)	2.6 (0.074)
8"	RCF	2%	HI-EX [®] 2%	1233-7976-6	115 (52)	2.6 (0.074)
8"	RCF	3%	P	1233-7976-2	115 (52)	2.6 (0.074)
8"	RCF	3%	AFFF	1233-7976-3	115 (52)	2.6 (0.074)
8"	RCF	3%	UG	1233-7976-4	115 (52)	2.6 (0.074)
8"	RCF	6%	AFFF	1233-7977-2	115 (52)	2.6 (0.074)
8"	RCF	6%	UCG-6	1233-7976-5	115 (52)	2.6 (0.074)

* Ratio controller supplied without metering orifice installed. Optional accessory metering orifice must be purchased separately.

Note:

- AFFF - Aqueous Film Forming Foam
- HI-EX[®] 2% - Hi-Expansion Foam
- P - Protein/Fluoroprotein
- UG - Universal Gold
- UCG-6 - Universal Coast Guard