



RATIO FLOW CONTROLLERS

The Chemguard ratio flow controller is a device designed to meter the correct amount of Chemguard foam concentrate into the water stream over a wide range of flows and pressures with minimal pressure loss. These devices are used in conjunction with either a bladder tank or a foam pump proportioning system. Chemguard ratio flow controllers are UL Listed and FM Approved with certain Chemguard foam concentrates. Typical applications include flammable liquid storage tanks, loading racks, aircraft hangars, and heliports or anywhere flammable liquids are used, stored, processed or transported.

The operating principle of the controller is based upon the use of a modified venturi. As water passes through the inlet nozzle, pressure is reduced in the annular area of the nozzle. This reduction allows the metering of foam concentrate into the water stream through a foam concentrate metering orifice.

SPECIFICATIONS

Chemguard offers the ratio flow controller body in five models. The 2-1/2" ratio flow controller is a threaded controller designed with a 2-1/2" female NPT threaded inlet and 2-1/2" male NPT threaded outlet. The 3", 4", 6" and 8" ratio flow controllers are "between the flanges" units designed to fit between two ANSI 150 lb. pipe flanges. Only the recovery section protrudes into the system water piping. To ensure a complete gasket seal when installing between flanges, each face of the controller is machined with 20 grooves per inch.

The ratio flow controller body is cast from ASTM UNS-C84400 Brass. The inlet nozzle and metering orifice are machined from SAE #72 Brass. The inlet nozzle set screws and metering orifice retaining ring are of stainless steel.

The inlet nozzle is secured by two stainless steel set screws. This allows the nozzle to be removed from

the controller for cleaning and/or repair.

Metering orifices are sized appropriately for each specified type and percentage foam concentrate. A stainless steel retaining ring secures the metering orifice in place.

The controller body is clearly marked with a flow direction arrow and label to identify the type of foam concentrate and injection percentage ratio.

FLOW RANGE

The Ratio Flow Controller Flow Range Table on page 4 lists the flow range for each ratio flow controller with respect to foam concentrate type. Please consult the Chemguard Engineering Department for specific applications or other foam concentrate types.

DESIGN INFORMATION

1. To ensure correct operation of a ratio flow controller when used with a bladder tank, the pressure of the foam concentrate at the controller must be within 2 psi of the incoming water pressure.
2. To ensure accurate proportioning over the flow range of the controller, minimum water inlet pressure of 30 psi must be available during operation of the system. A rule of thumb should include the water supply pipe to bladder tank and the concentrate supply pipe from bladder tank to controller foam inlet. The equivalent length of pipe including elbows, fittings and valve should be approximately 50 equivalent feet of the same pipe size as the foam inlet connection "D" on page 2.
3. Please review the controller dimension table for information on the minimum recommended length of straight pipe required upstream and downstream from the controller.

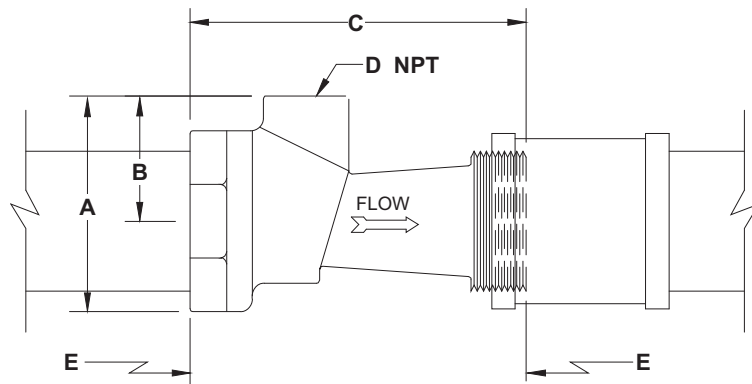
RATIO FLOW CONTROLLER DIMENSION TABLE

Ratio Flow Controller Size (Model)	Dimensions										
	A		B		C		D	***E		F	
	in.	(cm.)	in.	(cm.)	in.	(cm.)	in.	in.	(cm.)	lb.	(kg)
2-1/2" (CPC2.5)	4.3	10.9	2.40	6.10	6.9	17.5	1 NPT	12	31	8	3.6
3" (CPC3.0)	5.3	13.5	2.50	6.35	6.3	16.0	1-1/4 NPT	15	39	12	5.4
4" (CPC4.0)	6.8	17.3	2.75	6.99	8.0	20.3	1-1/2 NPT	20	51	22	10.0
6" (CPC6.0)	8.5	21.6	3.25	8.26	12.4	31.5	2 NPT	30	77	38	17.2
8" (CPC8.0)	10.9	27.7	3.55	9.02	12.4	31.5	2-1/2 NPT	40	102	73	33.1

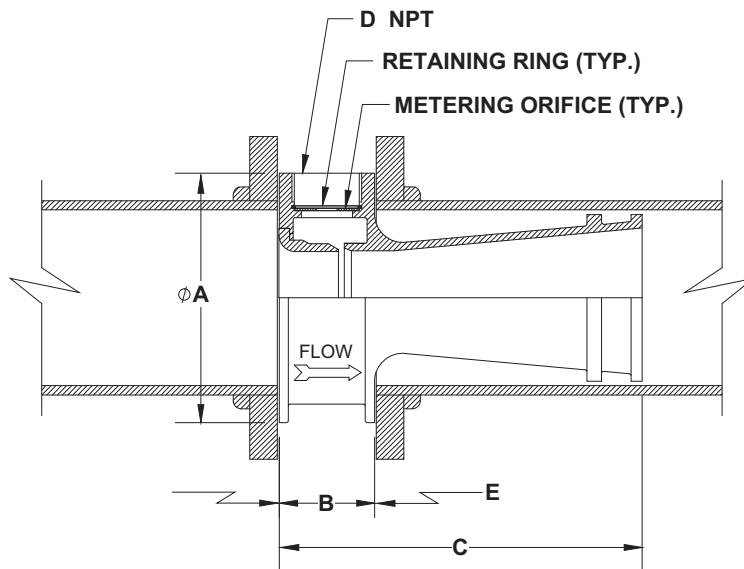
*** Straight pipe length required upstream and downstream.

Special Installation Note: A minimum of five (5) pipe diameters shall be allowed at the inlet and outlet of the proportioner.

**Model:
CPC2.5**



**Models:
CPC3.0, CPC4.0
CPC6.0, CPC8.0**



CHEM GUARD

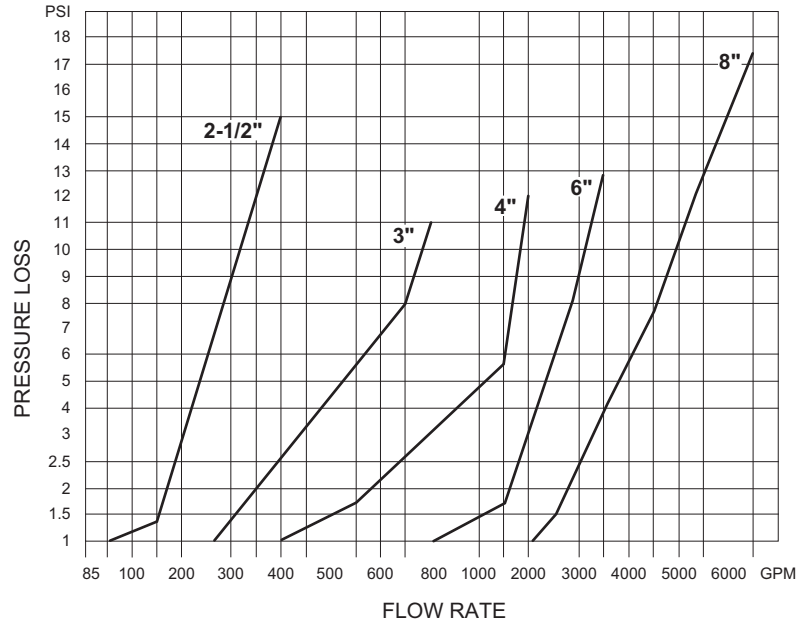
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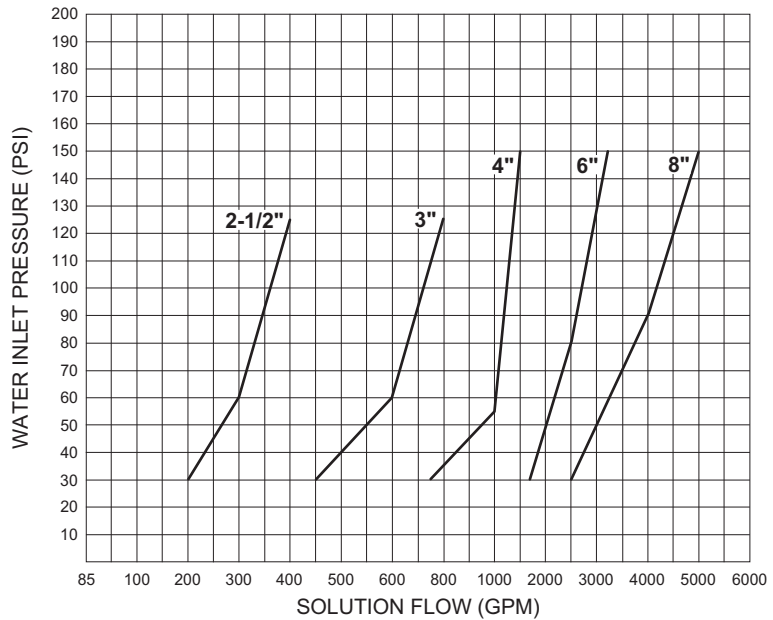
RATIO FLOW CONTROLLER - FLOW AND FRICTION LOSS CHARACTERISTICS

The following flow and friction loss characteristics are typical curves. For specific friction or flow in formation requirements please contact Chemguard.

**FRICTION
LOSS
CURVES**



**MINIMUM
INLET PRESSURE
VERSUS
FLOW**



RATIO FLOW CONTROLLER FLOW RANGE

Foam Concentrate Type	Ratio Flow Controller Flow Range - GPM (LPM)				
	2-1/2"	3"	4"	6"	8"
1% AFFF - C103	45-380 (170-1438)	76-779 (288-2949)	101-1482 (382-5610)	*147-2851 (556-10792)	313-3228 (1185-12219)
3% AFFF - C303	34-440 (129-1666)	43-772 (163-2922)	22-1400 (83-5300)	51-2842 (193-10758)	88-3899 (333-14759)
Ultraguard 3% AR-AFFF - CUG	114-385 (432-1457)	211-820 (799-3104)	410-1500 (1552-5678)	681-3188 (2578-12068)	1159-3284 (4387-12431)
6% AFFF - C603	40-400 (151-1514)	70-750 (265-2839)	200-1600 (757-6057)	300-3400 (1136-12870)	500-4400 (1893-16656)
3%/6% AR-AFFF @3% C363-3	117-249 (443-943)	194-753 (734-2850)	297-1334 (1124-5050)	708-2873 (2680-10875)	1510-4400 (5716-16656)
3%/6% AR-AFFF @6% C363-6	124-338 (469-1279)	196-755 (742-2858)	394-1379 (1491-5220)	960-3000 (3634-11356)	1510-4400 (5716-16656)
2% High Expansion - CX	124-249 (469-943)	165-779 (625-2949)	395-1100 (1495-4164)	810-2670 (3066-10107)	1510-4400 (5716-16656)
2% High Expansion - C2	124-249 (469-943)	165-779 (625-2949)	395-1100 (1495-4164)	810-2670 (3066-10107)	1510-4400 (5716-16656)
3% FP - C3FP	50-400 (189-1514)	70-750 (265-2839)	200-1600 (757-6057)	310-3000 (1173-11356)	500-4400 (1893-16656)
3% MS-AFFF - C301MS	40-400 (151-1514)	33-772 (125-2922)	53-1582 (201-5989)	100-3238 (379-12257)	149-3943 (563-14926)
3% AFFF - C302	43-400 (163-1514)	70-752 (265-2847)	200-1610 (757-6095)	308-3019 (1166-11428)	499-4401 (1889-16660)
3%/6% AR-AFFF @3% C361-3	164-402 (621-1522)	244-806 (924-3051)	400-1506 (1514-5701)	880-2875 (3331-10883)	1510-4400 (5716-16656)
3%/6% AR-AFFF @6% C361-6	144-400 (545-1514)	306-806 (1158-3051)	640-1615 (2423-6113)	2000-3019 (7571-11428)	1510-4400 (5716-16656)
6% MS-AFFF - C601MS	40-400 (151-1514)	70-750 (265-2839)	200-1600 (757-6057)	300-3400 (1136-12870)	500-4400 (1893-16656)

***Note:** Flow range shown is FM Approved Flow Range. UL Flow Range for 1% AFFF - C103 foam concentrate and 6" ratio flow controller is 203-2775 (768-10503).

ORDERING INFORMATION

Foam Concentrate Type	Ratio Flow Controller Part Numbers				
	2-1/2"	3"	4"	6"	8"
1% AFFF - C103	**EF10236	**EF10243	**EF10250	**EF10257	**EF10264
3% AFFF - C303	**EF10237	**EF10244	**EF10251	**EF10258	**EF10265
Ultraguard 3% AR-AFFF - CUG	**EF10238	**EF10245	**EF10252	**EF10259	**EF10266
6% AFFF - C603	EF10239	EF10246	EF10253	EF10260	EF10267
3%/6% AR-AFFF @3% C363-3	**EF10240	**EF10247	**EF10254	**EF10261	EF10268
3%/6% AR-AFFF @6% C363-6	**EF10241	**EF10248	**EF10255	EF10262	EF10269
2% High Expansion - CX	EF10242	EF10249	EF10256	EF10263	EF10270
2% High Expansion - C2	*EF10322	*EF10323	*EF10324	*EF10325	EF10326
3% FP - C3FP	EF10518	EF10519	EF10520	EF10521	EF10522
3% MS-AFFF - C301MS	*EF11515	**EF11520	**EF11525	**EF11530	**EF11535
3% AFFF - C302	**EF11512	**EF11517	**EF11522	**EF11527	**EF11532
3%/6% AR-AFFF @3% C361-3	*EF11513	*EF11518	*EF11523	*EF11528	EF11533
3%/6% AR-AFFF @6% C361-6	*EF11514	*EF11519	*EF11524	*EF11529	EF11534
6% MS-AFFF - C601MS	EF11516	EF11521	EF11526	EF11531	EF11536

* UL Listed

** UL Listed and FM Approved

Note: For FM Approved unit, complete approved system purchase required, i.e. ratio flow controller, bladder tank, foam concentrate and discharge device.



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