BLADDER TANK PROPORTIONING SYSTEM PRE-PIPED

HD FIRE PROTECT LIMITED

TECHNICAL DATA

TANK MOUNTING TYPE	Vertical or Horizontal
CONCENTRATE STORAGE CAPACITY	**For Vertical Tank:** 140 litres to 7500 litres (36 TO 2000 gallon (US)) **For Horizontal Tank:** 140 litres to 20000 litres (36 to 5285 gallon (US))
WORKING PRESSURE	30 psi (2.1 bar) to 175 psi (12 bar) standard supply or 225 psi (16 bar) optional supply (only UL listed)
OPERATING TEMPERATURE	35.6°F (2°C) to 167°F (75°C)
FACTORY HYDRO TEST PRESSURE	As per ASME code
FLOW	Refer Table-II & Table-III
VESSEL CONSTRUCTION	Carbon Steel as per ASME Code Section VIII Div 1, for unfired pressure vessels
CE Mark	Optional
ASME **"U"** STAMP	Optional
BLADDER	Buna-N
EXTERNAL PIPING	Water side: Carbon Steel Seamless Pipe Sch.40 Foam Concentrate side: Stainless Steel Sch.40
RATIO CONTROLLER	Wafer type - Standard supply Stainless Steel 304/CF8 Optional: Stainless Steel 316/ CF8M/Bronze/Nickel Al.Bronze Flanged Type - Optional supply (For size & flow refer product catalgue HD 263) or Table II & III
VENT AND DRAIN	Ball valve
APPROVALS	UL-Listed or FM Approved (Refer Table-I)
OPTIONAL SUPPLY	Refer to page 3
FINISH	Red RAL 3001
ORDERING INFORMATION	Specify: 1. Tank type, vertical or horizontal 2. Storage capacity 3. Model number, size of ratio controller with flow and pressure 4. Type of foam concentrate to be used and percentage of induction required 5. Optional items 6. UL or FM Approval Requirement



Note: The above images are for representative purpose, actual product may vary depending on the required accessories & specifications.

APPLICATION

The Bladder Tank Foam Proportioning System utilises water pressure to inject foam concentrate into water supply and automatically proportions foam concentrate over wide range of flow and pressure, with very low pressure drop. This system does not require a foam concentrate supply pump.

SPECIFICATION

The Bladder Tank Foam Proportioning Systems are available with vertical and horizontal bladder tanks. The carbon steel tanks are designed and constructed in accordance with ASME Code Section VIII Div.1 for unfired pressure vessels.

The maximum working pressure is 12 bar (175 psi). The vertical tank assembly is supported by legs welded to tank with provision for anchoring. The horizontal tanks are supported by two saddles welded to the tank and drilled for anchoring. Tank is provided with lifting lugs.

The system is supplied with pressure vessel, bladder, fill and drain valve for water and foam concentrate, ratio controller and vent valve.

Ladder and sight gauge assembly are supplied as optional items on request.

All valves are labeled showing normal working position and function. All tanks are oversized for allowing thermal expansion of the foam concentrate, if any.

PRINCIPLE OF OPERATION

The instructions for filling are provided with the equipment. Once the main water flow is established and water inlet and foam outlet valves are opened, the water enters the area between vessel wall and bladder, applying pressure to the bladder. The foam concentrate is forced out of the bladder through the foam concentrate outlet pipe and into the ratio controller through metering orifice. The concentrate pressure and water inlet pressure at ratio controller will be same, as the main water supply pressure is utilised to expel the foam from the bladder. The water flowing through the ratio controller jet creates a low pressure area for foam concentrate. This injects the concentrate in to the ratio controller through an accurate sized orifice proportioned to water venturi. This ensures correct proportioning over a wide range of flow condition.

The bladder tank proportioning system operates on same principle as that of a balance pressure proportioning system. In bladder system, the bladder is used as diaphragm to separate the water and foam concentrate within the tank. The foam concentrate is injected into the ratio controller utilising water pressure.

The system is also supplied with foam concentrate control valve as an optional item. The valve allows concentrate flow only when minimum of 2.1 kg/sq.cm water pressure is established in the system. For pressure drop and flow characteristics refer catalogue of ratio controller.

HD FIRE Bladder tanks and proportioners are UL Listed and FM Approved with various HD foam concentrates, refer individual listing and approval data.

"U' stamp (The American Society of Mechanical Engineers- ASME) code stamp. This ASME certification is optional.

Bladder tanks 900 Liters and larger are CE marked on conformance with the European Pressure Equipment Directives. CE marking is optional.

SELECTION OF HORIZONTAL / VERTICAL BLADDER TANKS

Advantages of Horizontal bladder tanks

(i) Better stability than vertical tank in earthquake prone area

(ii) Easier to refill than vertical tanks

(iii) Easy to transport, store and install

(iv) Large Capacity

Advantages of Vertical bladder tanks

(i) Require less floor space than horizontal tanks

INSTALLATION, INSPECTION AND MAINTENANCE

An installation, inspection and maintenance manual is packed with each unit. The manual provides detail schematic, initial procedure, inspection and maintenance procedures. The instruction manual must be read carefully and followed during installation and commissioning of the system.

After few initial successful tests an authorised person must be trained to perform inspection and testing of the system. It is recommended to carry out physical inspection of the system regularly, the inspector should verify that no damages have taken place to any component and all the valves are in their proper position as per the system requirement. The system should be fully tested at least once in a year and in accordance with applicable NFPA code or in accordance to the guidelines of the organisation having local jurisdiction.

Do not turn off the system or any valve to repair or test the system, without placing a roving Fire Patrol in the area covered by the system. The patrol should continue until the system is put back in service. Also inform the local security personnel and the control room so that a false alarm is not signalled.

CAUTION ⚠

1) Do not weld on the tank as it may damage the bladder fitted inside the tank.

2) Release pressure before an inspection and maintenance of the system.

3) Sight gauge is not pressure tight, so before taking concentrate level reading, tank pressure must be released.

4) The bladder tank is to be installed under a shed to avoid direct sunlight on the equipment.

5) While designing a foam system, step shall be taken to allow for removal of the internal centre tube(s). The centre tubes are full length and/or height of the bladder tank.

6) ASME Code may require over pressure protection before pressurising the system. HD FIRE does not supply an over pressure relief valve with the tanks. It shall be the owner's responsibility to provide over pressure protection for the tank in accordance to ASME Code.

7) Foam concentrate filling procedure must be followed. Incorrect filling procedure may damage the bladder. HD product have limited warranty and incorrect fill procedure will void the warranty.

NOTE

1) The foam concentrate is to be filled in the bladder very carefully to avoid rupture of bladder. The filling guidelines provided with the equipment must be strictly adhered.

2) Air supply with regulator (0 to 1.0 kg/sq.cm) required during filling procedure, to be arranged by installer / user.

3) Water supply at 0-1.5 kg/sq.cm required for tank filling during commissioning, to be arranged by installer / user.

4) Concentrate fill pump is to be arranged by installer / user.

5) A minimum length of 5 (five) times the pipe diameter of unobstructed straight pipeline should be provided at the inlet and outlet of the ratio controller, where pipe diameter is the nominal size of the ratio controller.

6) FM Approval for Bladder tank is applicable as per FM Approved Low Expansion System, where FM Approved Foam Concentrate, Bladder tank, Ratio Controller/Foam Proportioner, Foam Discharge Devices/ Foam-Water Sprinklers are installed in the system.

7) Foam Concentrate Control Valve is requirement for FM Approval, and is not permited by UL.Hence Tanks will be either UL Listed or FM Approved.

8) Multiple Ratio Controllers cannot be used if it is UL Listed Bladder tank.

9) FM Approved Bladder tank can have maximum of two Ratio Controllers, two installed on different sides.

10) Each tank is designed & tested for specific type of foam concentrate, hence specify in order the concentrate type to be used.

11) The systm is to be designed in accordance with latest standard of NFPA11, standard for Low, Medium and High Expansion Foam.

OPTIONAL SUPPLY

- Sight gauge with shut off and drain valve (glass or polycarbonate material)
- Ladder
- Pressure Gauges
- Concentrate control valve
- Filling kit with foam concentrate filling pump
- Stainless steel pipe for water supply side
- Stainless steel pipe & valve standard supply SS304/CF8. Optional is SS316/CF8M or SS316L/CF3M
- Painting as per specific requirement
- Seismic designed tanks
- Custom design for higher rating, material and dimension
- Internal surface is epoxy painted as standard supply, or any other paint as per customer requirement
- Ratio controller material Bronze, Stainless steel CF8, CF8M or CF8ML, Nickel Al. Bronze
- Relief valve is not included in standard supply it is optional as per specific customer requirement
- Tank design as per specific corrosion allowance.

RELIEF VALVE (OPTIONAL SUPPLY)

(i) Thermal Relief valve

(ii) Full flow, as per ASME

(iii) Full flow, ASME “U” Stamped

LISTING & APPROVAL

1) Bladder tank proportioning system is UL Listed or FM Approved as pre-piped system. Non-Prepiped system is optional supply and need to be piped as per our approved drawings only.

2) Listing and Approval is valid only when used in the manner as outlined in the applicable Listing and Approval.

3) Foam Concentrate Control Valve is standard supply with FM Approved Bladder tank.

4) CE marking is optional.

5) ASME “U“ stamp is optional.

SHIPPING DETAILS

i) All the tank openings will be plugged for shipping.

ii) All pre-piped pipes, valves, pressure gauges, sight gauge etc will be packed separately for shipping.

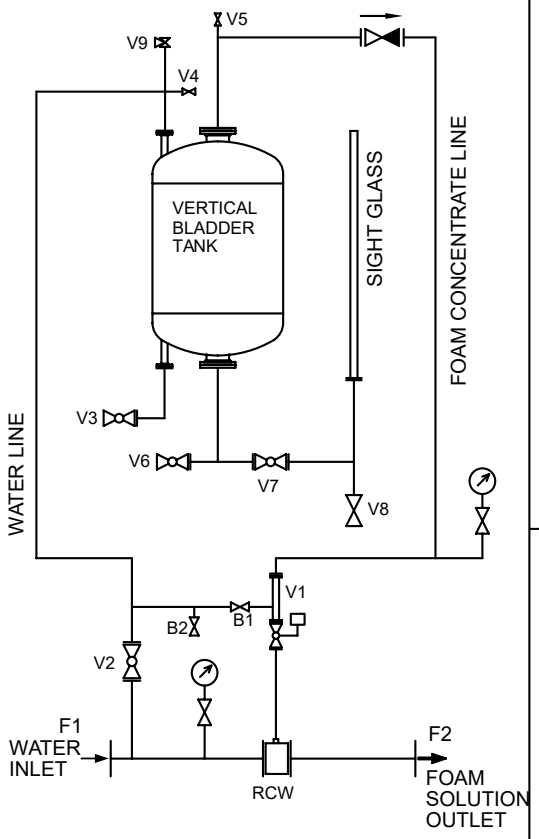
iii) Tank will be mounted on pallet and wrapped with plastic as standard packing system of HD FIRE. For any custom packing requirement contact HD Sales.

TABLE - I

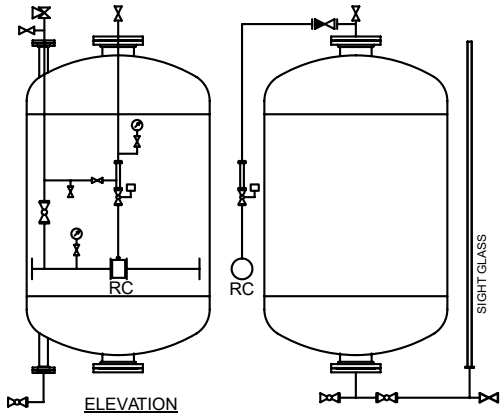
TankType	Tank Capacity	Working Pressure		Approvals with Foam Type					
				AFFF 3-C6		AR-AFFF 3x3-C6		AR-SFFF F3	
		Standard Supply	Optional Supply	UL	FM	UL	FM	UL	FM
Vertical	140 to 7500 litres (36 to1982 US Gallons)	30 to 175 psi (2.1 to 12 bar)		✓	✓	✓	✓	✓	–
			30 to 225 psi (2.1 to 16 bar)	✓	–	✓	–	✓	–
Horizontal	140 to 15000 litres (36 to 3963 US Gallons)	30 to 175 psi (2.1 to 12 bar)		✓	✓	✓	✓	✓	–
			30 to 225 psi (2.1 to 16 bar)	✓	–	✓	–	✓	–
	15000 to 20000 litres (3963 to 5285 US Gallons)	30 to 175 psi (2.1 to 12 bar)		✓	–	✓	–	✓	–
			30 to 225 psi (2.1 to 16 bar)	✓	–	✓	–	✓	–

VERTICAL BLADDER TANK WITH SINGLE RATIO CONTROLLER

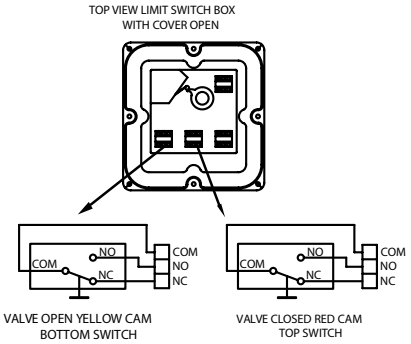
P. & I. DIAGRAM



SCHEMATIC DIAGRAM



ELECTRICAL CONNECTION DIAGRAM



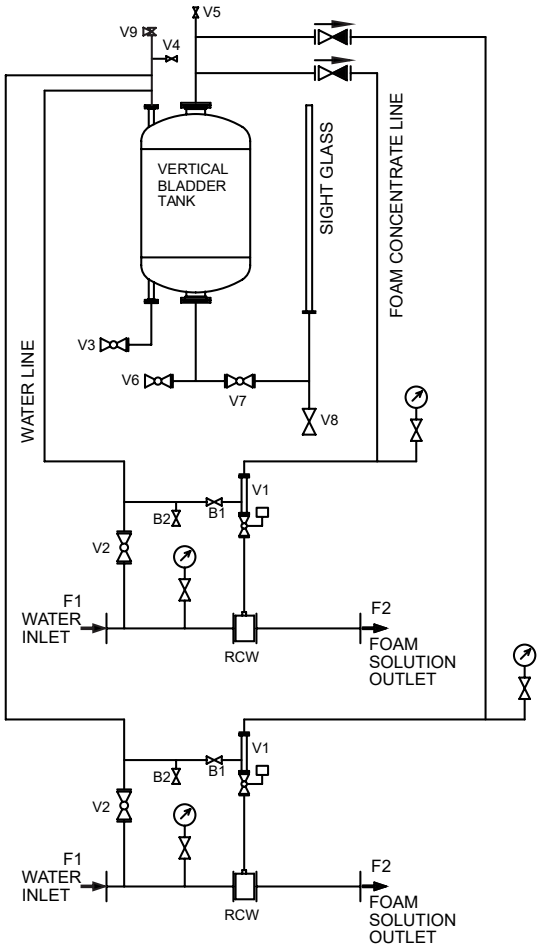
SYMBOLS & ABBREVIATION

- NON RETURN VALVE
- VALVE
- BALL VALVE
- THERMAL RELIEF VALVE
- RATIO CONTROLLER
- PRESSURE GAUGE
- AUTO. VALVE WITH LIMIT SWITCHES (ONLY WITH FM APPROVED TANK)

VALVE No.	DESCRIPTION	NORMAL POSITION	
		MANUAL SYSTEM	AUTO. SYSTEM
V1	AUTO. FOAM CONCENTRATE VALVE WITH LIMIT SWITCH	---	CLOSED
V2	WATER PRESSURE SHUT OFF VALVE	OPEN	OPEN
V3	TANK DRAIN VALVE	CLOSED	CLOSED
V4	TANK VENT VALVE	CLOSED	CLOSED
V5	BLADDER VENT VALVE	CLOSED	CLOSED
V6	BLADDER FILL / DRAIN VALVE	CLOSED	CLOSED
V7	SIGHT GLASS FILL VALVE	CLOSED	CLOSED
V8	SIGHT GLASS DRAIN VALVE	CLOSED	CLOSED
V9	THERMAL RELIEF VALVE	CLOSED	CLOSED
B1	MANUAL OVER RIDE VALVE	---	OPEN
B2	RESETTING VALVE	---	CLOSED

VERTICAL BLADDER TANK WITH TWO RATIO CONTROLLERS

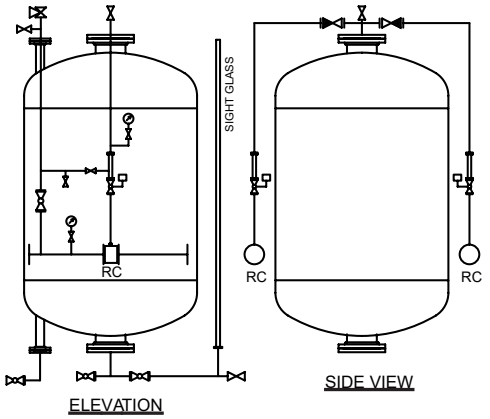
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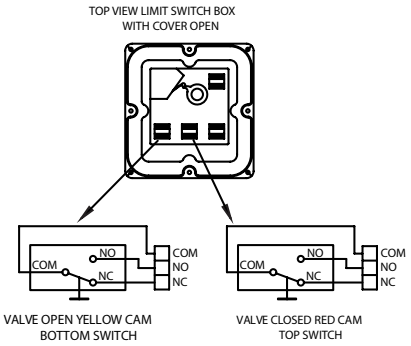
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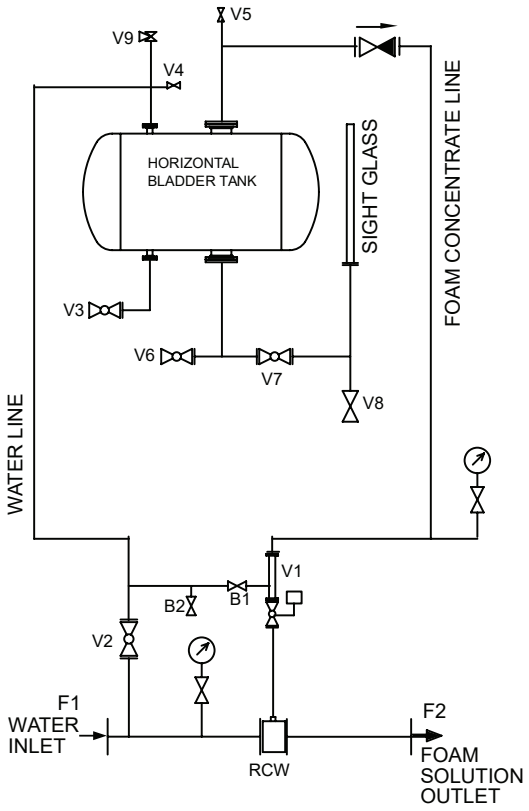
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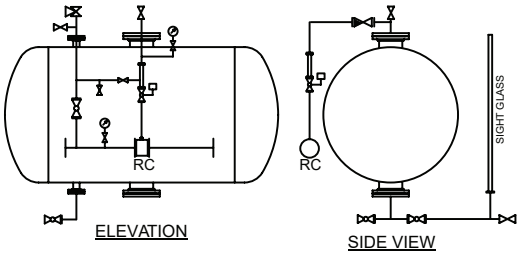
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V9	THERMAL RELIEF VALVE	CLOSED	CLOSED
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HORIZONTAL BLADDER TANK WITH SINGLE RATIO CONTROLLER

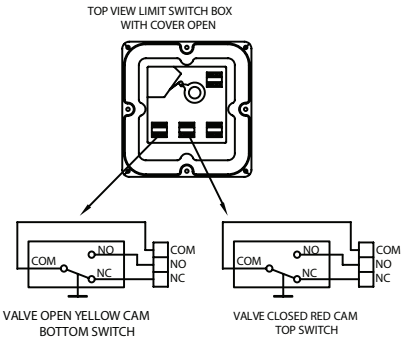
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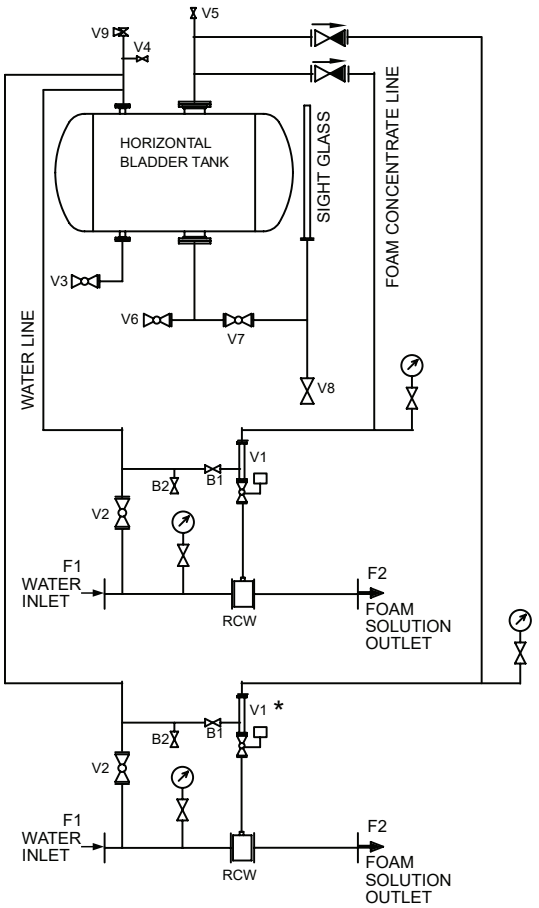
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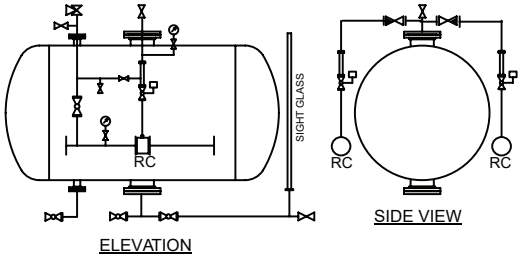
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HORIZONTAL BLADDER TANK WITH TWO RATIO CONTROLLERS

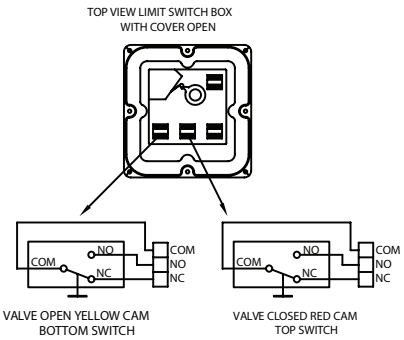
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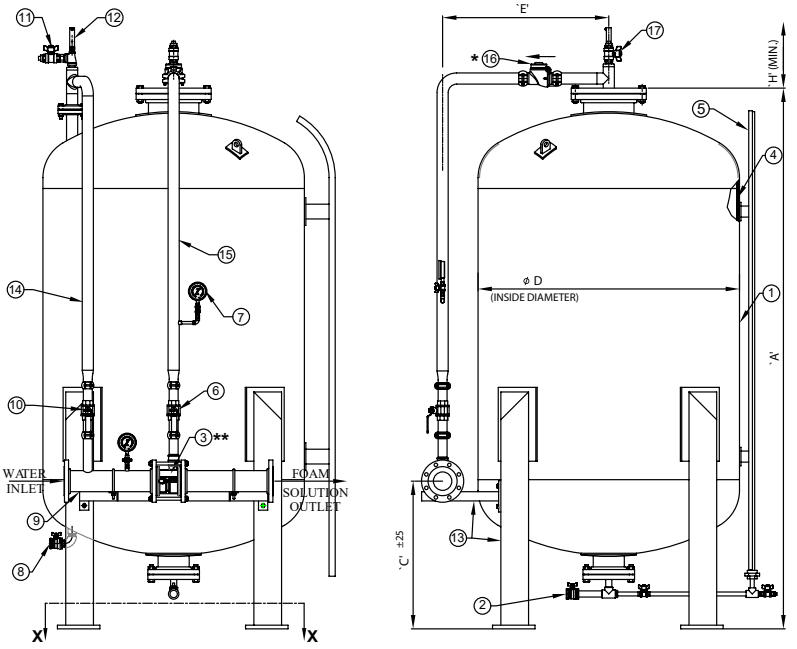


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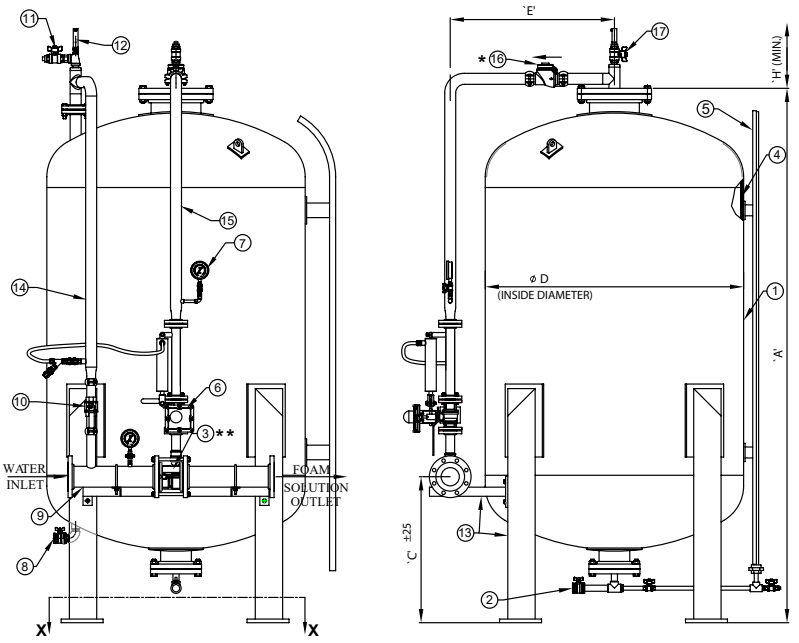
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V4	TANK VENT VALVE	CLOSED	CLOSED
V5	BLADDER VENT VALVE	CLOSED	CLOSED
V6	BLADDER FILL / DRAIN VALVE	CLOSED	CLOSED
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VERTICAL BLADDER TANK

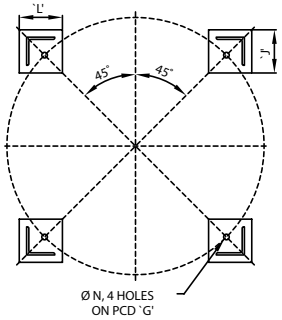


WITHOUT CONCENTRATE CONTROL VALVE



WITH CONCENTRATE CONTROL VALVE

SR. NO.	DESCRIPTION	MATERIAL SPECIFICATION
1	TANK	SA 516 GR. 70 (OR EQUIVALENT)
2	BLADDER FILL / DRAIN VALVE	BRASS
3	RATIO CONTROLLER	SS 304 / BRONZE/ SS316
4	BLADDER	BUNA-N
5	SIGHT GLASS	POLYCARBONATE
6	FOAM CONC. SHUT OFF VALVE	SS 304
7	PRESSURE GAUGE	STD. 0 TO 300 PSI
8	TANK DRAIN VALVE	BRASS
9	SPOOL PIECE	A106 SEAMLESS, SCH. 40
10	WATER SHUT OFF VALVE	SS 304
11	TANK VENT VALVE	BRASS
12	TANK SAFETY VALVE (THERMAL)	BRASS
13	SADDLE/ ANGLE LEGS SUPPORT	C.S.
14	WATER INLET LINE	A106 SEAMLESS, SCH. 40
15	FOAM CONCENTRATE LINE	SS 304, SCH. 40
16	CHECK VALVE	SS 304
17	BLADDER VENT VALVE	BRASS



SECTION - 'X-X'

* GROOVED - STANDARD SUPPLY, FLANGED - OPTIONAL
** WAFER TYPE STANDARD SUPPLY, FLANGED - OPTIONAL
NOTE: CONCENTRATE CONTROL VALVE IS MANDATORY WITH FM APPROVED PRODUCT

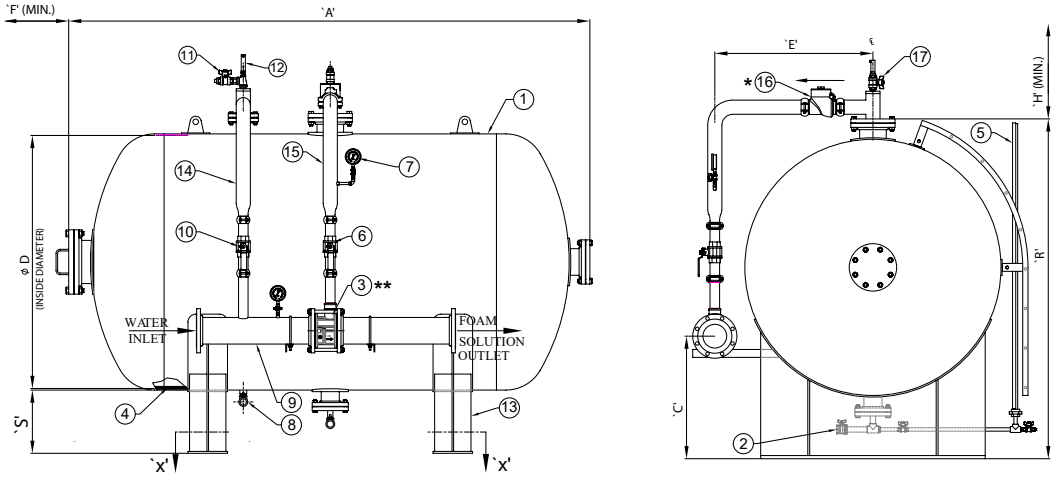
SELECTION OF FOAM CONCENTRATE CONTROL VALVE FOR HORIZONTAL & VERTICAL BLADDER TANK	
HD RATIO CONTROLLER	**FOAM CONCENTRATE CONTROL VALVE SIZE**
65 NB	25 NB
80 NB	40 NB
100 NB	40 NB
150 NB	50 NB
200 NB	50 NB

CAPACITY & DIMENSIONAL CHART FOR VERTICAL BLADDER TANK

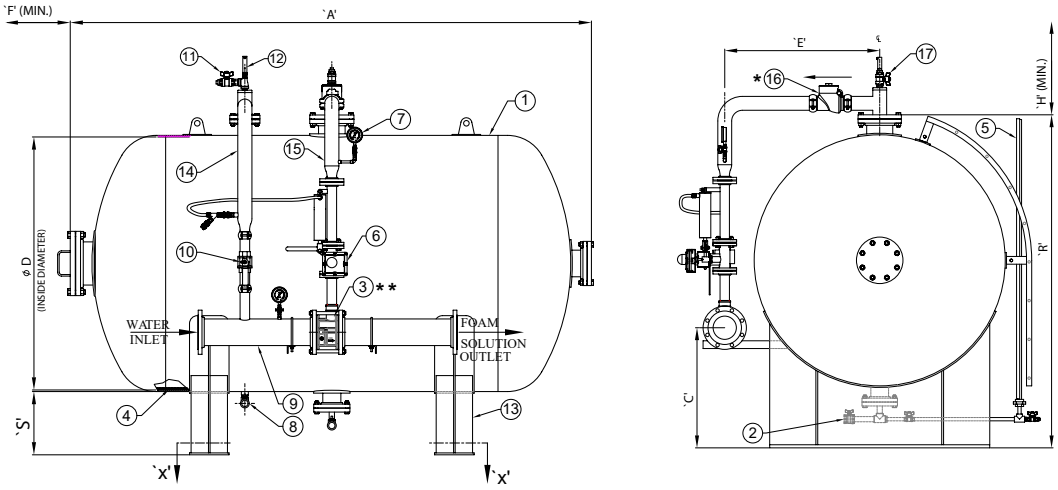
CAPACITY *LITRES	Ø D (I.D.)	A	C	E	G	H (MIN.)	J	L	N
140	500	1418	525	500	462	1250	150	150	Ø 25
150	500	1466	525	500	462	1250	150	150	Ø 25
200	600	1423	575	500	560	1250	150	150	Ø 25
250	600	1618	575	500	560	1450	150	150	Ø 25
300	600	1811	575	500	560	1640	150	150	Ø 25
350	600	2006	575	500	560	1835	150	150	Ø 25
400	600	2200	575	500	560	2030	150	150	Ø 25
450	750	1790	625	580	710	1625	200	200	Ø 25
500	750	1915	625	580	710	1750	200	200	Ø 25
550	750	2039	625	580	710	1875	200	200	Ø 25
600	750	2164	625	580	710	2000	200	200	Ø 25
650	850	1947	675	625	810	1780	200	200	Ø 25
700	850	2044	675	625	810	1875	200	200	Ø 25
750	850	2141	675	625	810	1975	200	200	Ø 25
800	850	2237	675	625	810	2070	200	200	Ø 25
850	850	2334	675	625	810	2165	200	200	Ø 25
900	850	2431	675	625	810	2265	200	200	Ø 25
950	850	2528	675	625	810	2360	200	200	Ø 25
1000	1000	2112	750	700	960	1950	200	200	Ø 30
1100	1000	2252	750	700	960	2090	200	200	Ø 30
1200	1000	2392	750	700	960	2230	200	200	Ø 30
1300	1000	2532	750	700	960	2370	200	200	Ø 30
1400	1000	2672	750	700	960	2510	200	200	Ø 30
1500	1000	2813	750	700	960	2650	200	200	Ø 30
1600	1000	2953	750	700	960	2790	200	200	Ø 30
1700	1000	3093	750	700	960	2930	200	200	Ø 30
1800	1200	2502	800	800	1160	2330	230	230	Ø 30
1900	1200	2599	800	800	1160	2430	230	230	Ø 30
2000	1200	2696	800	800	1160	2525	230	230	Ø 30
2200	1200	2891	800	800	1160	2720	230	230	Ø 30
2400	1200	3085	800	800	1160	2915	230	230	Ø 30
2600	1200	3280	800	800	1160	3110	230	230	Ø 30
2800	1200	3474	800	800	1160	3300	230	230	Ø 30
3000	1400	2927	800	900	1370	2750	230	230	Ø 30
3250	1400	3106	800	900	1370	2930	230	230	Ø 30
3500	1400	3284	800	900	1370	3110	230	230	Ø 30
3750	1400	3463	800	900	1370	3290	230	230	Ø 30
4000	1400	3642	800	900	1370	3465	230	230	Ø 30
4250	1600	3146	800	1000	1500	2975	300	300	Ø 30
4500	1600	3283	800	1000	1500	3110	300	300	Ø 30
4750	1600	3419	800	1000	1500	3250	300	300	Ø 30
5000	1600	3556	800	1000	1500	3385	300	300	Ø 30
5250	1600	3693	800	1000	1500	3525	300	300	Ø 30
5500	1725	3431	800	1060	1640	3255	300	300	Ø 30
5750	1725	3548	800	1060	1640	3370	300	300	Ø 30
6000	1725	3666	800	1060	1640	3490	300	300	Ø 30
6250	1725	3784	800	1060	1640	3610	300	300	Ø 30
6500	1725	3901	800	1060	1640	3720	300	300	Ø 30
6750	1725	4019	800	1060	1640	3850	300	300	Ø 30
7000	1725	4137	800	1060	1640	3960	300	300	Ø 30
7250	1725	4254	800	1060	1640	4080	300	300	Ø 30
7500	1725	4372	800	1060	1640	4200	300	300	Ø 30

***Note: Litres x 3.785 = Gallons**

HORIZONTAL BLADDER TANK

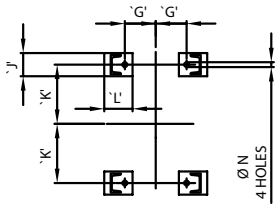


WITHOUT CONCENTRATE CONTROL VALVE

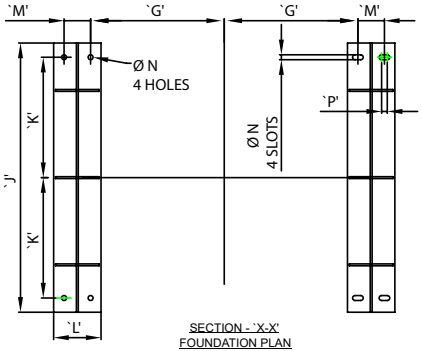


WITH CONCENTRATE CONTROL VALVE

SR.NO.	DESCRIPTION	MATERIAL SPECIFICATION
1	TANK	SA 516 GR.70 (OR EQUIVALENT)
2	BLADDER FILL/ DRAIN VALVE	BRASS
3	RATIO CONTROLLER **	SS 304 / BRONZE / SS 316
4	BLADDER	BUNA-N
5	SIGHT GLASS	POLYCARBONATE
6	FOAM CONC. SHUT OFF VALVE	SS 304
7	PRESSURE GAUGE	STD. 0 TO 300 PSI
8	TANK DRAIN VALVE	BRASS
9	SPOOL PIECE	A106 SEAMLESS, SCH.40
10	WATER SHUT OFF VALVE	SS 304
11	TANK VENT VALVE	BRASS
12	TANK SAFETY VALVE (THERMAL)	BRASS
13	SADDLE/ ANGLE LEGS SUPPORT	C.S.
14	WATER INLET LINE	A106 SEAMLESS, SCH.40
15	FOAM CONCENTRATE LINE	SS 304, SCH.40
16	CHECK VALVE	SS 304
17	BLADDER VENT VALVE	BRASS



SECTION - `X-X'
FOUNDATION PLAN
(200 L TO 1700 L)



SECTION - `X-X'
FOUNDATION PLAN
(1800 L TO 15000 L)

* GROOVED - STANDARD SUPPLY, FLANGED - OPTIONAL
** WAFER TYPE STANDARD SUPPLY, FLANGED - OPTIONAL
NOTE: CONCENTRATE CONTROL VALVE IS MANDATORY WITH FM APPROVED PRODUCT

CAPACITY & DIMENSIONAL CHART FOR HORIZONTAL BLADDER TANK

CAPACITY LITERS	Ø D (I.D.)	A	C	E	F (MIN)	G	H (MIN)	J	K	L	M	N	P	R	S
200	600	1146	550	500	1250	120	875	90	230	110	-	Ø19	-	1142	400
250	600	1341	550	500	1445	215	875	90	230	110	-	Ø19	-	1142	400
300	600	1535	550	500	1640	315	875	90	230	110	-	Ø19	-	1142	400
350	600	1730	550	500	1835	410	875	90	230	110	-	Ø19	-	1142	400
400	600	1924	550	500	2030	510	875	90	230	110	-	Ø19	-	1142	400
450	750	1519	575	580	1610	260	1125	120	245	130	-	Ø19	-	1293	400
500	750	1644	575	580	1735	320	1125	120	245	130	-	Ø19	-	1293	400
550	750	1768	575	580	1860	385	1125	120	245	130	-	Ø19	-	1293	400
600	720	1893	575	580	1985	445	1125	120	245	130	-	Ø19	-	1293	400
650	850	1678	625	625	1770	300	1230	120	310	140	-	Ø19	-	1394	400
700	850	1775	625	625	1870	350	1230	120	310	140	-	Ø19	-	1394	400
750	850	1872	625	625	1965	400	1230	120	310	140	-	Ø19	-	1394	400
800	850	1968	625	625	2060	445	1230	120	310	140	-	Ø19	-	1394	400
850	850	2065	625	625	2160	495	1230	120	310	140	-	Ø19	-	1394	400
900	850	2162	625	625	2255	540	1230	120	310	140	-	Ø19	-	1394	400
950	850	2259	625	625	2350	590	1230	120	310	140	-	Ø19	-	1394	400
1000	1000	1848	675	700	1945	320	1370	170	360	185	-	Ø22	-	1542	400
1100	1000	1988	675	700	2085	385	1370	170	360	185	-	Ø22	-	1542	400
1200	1000	2128	675	700	2225	430	1370	170	360	185	-	Ø22	-	1542	400
1300	1000	2268	675	700	2365	500	1370	170	360	185	-	Ø22	-	1542	400
1400	1000	2408	675	700	2500	570	1370	170	360	185	-	Ø22	-	1542	400
1500	1000	2548	675	700	2640	600	1370	170	360	185	-	Ø22	-	1542	400
1600	1000	2689	675	700	2785	675	1370	170	360	185	-	Ø22	-	1542	400
1700	1000	2829	675	700	2925	750	1370	170	360	185	-	Ø22	-	1542	400
1800	1200	2234	700	800	2330	500	1575	1067	450	135	-	Ø26 2 Holes	30 2 Slots	1745	400
1900	1200	2331	700	800	2430	550	1575	1067	450	135	-	Ø26 2 Holes	30 2 Slots	1745	400
2000	1200	2428	700	800	2525	600	1575	1067	450	135	-	Ø26 2 Holes	30 2 Slots	1745	400
2200	1200	2623	700	800	2720	675	1575	1067	450	135	-	Ø26 2 Holes	30 2 Slots	1745	400
2400	1200	2817	700	800	2915	685	1575	1050	450	250	140	Ø26	30	1745	400
2600	1200	3012	700	800	3110	755	1575	1050	450	250	140	Ø26	30	1745	400
2800	1200	3206	700	800	3300	830	1575	1050	450	250	140	Ø26	30	1745	400
3000	1400	2659	650	900	2755	535	1775	1250	550	250	140	Ø26	30	1946	400
3250	1400	2838	650	900	2835	620	1775	1250	550	250	140	Ø26	30	1946	400
3500	1400	3016	650	900	3110	710	1775	1250	550	250	140	Ø26	30	1946	400
3750	1400	3195	650	900	3290	780	1775	1250	550	250	140	Ø26	30	1946	400
4000	1400	3374	650	900	3470	860	1775	1250	550	250	140	Ø26	30	1946	400
4250	1400	3552	650	900	3645	940	1775	1250	550	250	140	Ø26	30	1946	400
4500	1400	3731	650	900	3825	1020	1775	1250	550	250	140	Ø26	30	1946	400
4750	1400	3910	650	900	4005	1100	1775	1250	550	250	140	Ø26	30	1946	400
5000	1600	3287	775	1000	3380	705	1980	1420	635	250	140	Ø26	30	2149	400
5250	1600	3424	775	1000	3515	775	1980	1420	635	250	140	Ø26	30	2149	400
5500	1600	3561	775	1000	3655	845	1980	1420	635	250	140	Ø26	30	2149	400
5750	1600	3697	775	1000	3790	915	1980	1420	635	250	140	Ø26	30	2149	400
6000	1600	3834	775	1000	3930	985	1980	1420	635	250	140	Ø26	30	2149	400
6250	1600	3971	775	1000	4065	1055	1980	1420	635	250	140	Ø26	30	2149	400
6500	1600	4108	775	1000	4205	1125	1980	1420	635	250	140	Ø26	30	2149	400
6750	1600	4245	775	1000	4340	1195	1980	1420	635	250	140	Ø26	30	2149	400
7000	1600	4381	775	1000	4475	1265	1980	1420	635	250	140	Ø26	30	2149	400

CAPACITY & DIMENSIONAL CHART FOR HORIZONTAL BLADDER TANK

CAPACITY LITERS	Ø D (I.D.)	A	C	E	F (MIN)	G	H (MIN)	J	K	L	M	N	P	R	S
7250	1600	4518	775	1000	4615	1335	1980	1420	635	250	140	Ø26	30	2149	400
7500	1600	4655	775	1000	4750	1405	1980	1420	635	250	140	Ø26	30	2149	400
7750	1725	4220	675	1060	4315	1050	2100	1530	690	350	200	Ø26	30	2174	300
8000	1725	4337	675	1060	4435	1110	2100	1530	690	350	200	Ø26	30	2174	300
8250	1725	4455	675	1060	4550	1170	2100	1530	690	350	200	Ø26	30	2174	300
8500	1725	4573	675	1060	4670	1240	2100	1530	690	350	200	Ø26	30	2174	300
8750	1725	4690	675	1060	4785	1290	2100	1530	690	350	200	Ø26	30	2174	300
9000	1725	4808	675	1060	4905	1320	2100	1530	690	350	200	Ø26	30	2174	300
9250	1725	4926	675	1060	5020	1380	2100	1530	690	350	200	Ø26	30	2174	300
9500	1725	5043	675	1060	5140	1440	2100	1530	690	350	200	Ø26	30	2174	300
9750	1725	5161	675	1060	5256	1500	2100	1530	690	350	200	Ø26	30	2174	300
10000	1725	5279	675	1060	5375	1365	2100	1530	690	350	200	Ø26	30	2174	300
10500	1725	5514	675	1060	5610	1480	2100	1530	690	350	200	Ø26	30	2174	300
11000	1725	5749	675	1060	5845	1600	2100	1530	690	350	200	Ø26	30	2174	300
11500	1725	5985	675	1060	6080	1700	2100	1530	690	350	200	Ø26	30	2174	300
12000	1725	6220	675	1060	6315	1700	2100	1530	690	350	200	Ø26	30	2174	300
12500	1725	6455	675	1060	6550	1815	2100	1530	690	350	200	Ø26	30	2174	300
13000	1725	6691	675	1060	6790	1935	2100	1530	690	350	200	Ø26	30	2174	300
13500	1725	6926	675	1060	7021	2050	2100	1530	690	350	200	Ø26	30	2174	300
14000	1725	7162	675	1060	7260	2170	2100	1530	690	350	200	Ø26	30	2174	300
14500	1725	7397	675	1060	7495	2300	2100	1530	690	350	200	Ø26	30	2174	300
15000	1725	7632	675	1060	7730	2300	2100	1530	690	350	200	Ø26	30	2174	300
15500	2100	5500	650	1250	5650	1500	2550	1900	875	400	250	Ø26	30	2555	300
16000	2100	5660	650	1250	5810	1550	2550	1900	875	400	250	Ø26	30	2555	300
16500	2100	5820	650	1250	5970	1650	2550	1900	875	400	250	Ø26	30	2555	300
17000	2100	5980	650	1250	6130	1700	2550	1900	875	400	250	Ø26	30	2555	300
17500	2100	6135	650	1250	6285	1750	2550	1900	875	400	250	Ø26	30	2555	300
18000	2100	6300	650	1250	6450	1800	2550	1900	875	400	250	Ø26	30	2555	300
18500	2100	6455	650	1250	6605	1850	2550	1900	875	400	250	Ø26	30	2555	300
19000	2100	6610	650	1250	6760	1900	2550	1900	875	400	250	Ø26	30	2555	300
19500	2100	6770	650	1250	6920	1950	2550	1900	875	400	250	Ø26	30	2555	300
20000	2100	6940	650	1250	7090	2050	2550	1900	875	400	250	Ø26	30	2555	300

UL LISTED RATIO CONTROLLER FLOW RANGE (TABLE-II)

Size	Model		UL Listed (Flow in LPM)		
	Wafer Style	Flange Style	AFFF 3%	AR-AFFF 3x3%	AR-SFFF F3 3x3%
65 NB	RCW-B, RCW-S, RCW-N	RCF-B, RCF-S, RCF-N	100 to 1550	421 to 1460	595 to 1440
	RCW-BM, RCW-SM, RCW-NM	RCF-BM, RCF-SM, RCF-NM	-----	160 to 582	203 to 605
80 NB	RCW-B, RCW-S, RCW-N	RCF-B, RCF-S, RCF-N	260 to 3000	787 to 3060	900 to 3075
	RCW-BM, RCW-SM, RCW-NM	RCF-BM, RCF-SM, RCF-NM	-----	-----	-----
100 NB	RCW-B, RCW-S, RCW-N	RCF-B, RCF-S, RCF-N	650 to 6000	1140 to 6060	1580 to 5910
150 NB	RCW-B, RCW-S, RCW-N	RCF-B, RCF-S, RCF-N	1200 to 12000	-----	2668 to 12425
	RCW-BM, RCW-SM, RCW-NM	RCF-BM, RCF-SM, RCF-NM	-----	2370 to 12210	-----
200 NB	RCW-B, RCW-S, RCW-N	RCF-B, RCF-S, RCF-N	2750 to 17860	2320 to 17500	6950 to 17200

FM APPROVED RATIO CONTROLLER FLOW RANGE (TABLE-III)

Size	Model		FM Approved (Flow in LPM)	
	Wafer Style	Flange Style	AFFF 3%	AR-AFFF 3X3%
65 NB	RCW-B, RCW-S	RCF-B, RCF-S	102 TO 1590	500 TO 1030
	RCW-BM, RCW-SM	RCF-BM, RCF-SM	-----	165 TO 528
80 NB	RCW-B, RCW-S	RCF-B, RCF-S	290 TO 2990	-----
	RCW-BM, RCW-SM	RCF-BM, RCF-SM	-----	820 TO 3080
100 NB	RCW-B, RCW-S	RCF-B, RCF-S	600 TO 6050	1810 TO 6140
150 NB	RCW-B, RCW-S	RCF-B, RCF-S	1200 TO 11460	5000 TO 12300
	RCW-BM, RCW-SM	RCF-BM, RCF-SM	-----	-----
200 NB	RCW-B, RCW-S	RCF-B, RCF-S	-----	-----

NOTE:

1. All dimensions are approximate and may vary slightly.
2. Ratio Controller supplied is wafer type, flanged end will be optional.
   Stainless Steel CF8 (SS304) is standard supply. Bronze or CF8M (SS316) is optional supply.
3. For space requirement of Bladder Tank, provision must be made for removal of internal piping and bladder. There are dimensions as marked and given in dimensional chart.
4. Manhole cover is not considered in standard supply and can be supplied at additional cost.
5. For tank exceeding shipping crate or container size, piping will be supplied in disassembled condition.
6. Level indicator is always supplied disassembled.
7. Large capacity Bladder Tank may require high roof or open roof for loading and unloading. Check will sales for details.
8. Optional sight glass level check may not indicate correct level with AR-AFFF foam concentrate.
9. Foam filling kit needs to be ordered separately.

LIMITED WARRANTY

HD FIRE PROTECT LIMITED (Formerly known as HD FIRE PROTECT PVT. LTD.) hereby referred to as HD FIRE, warrants to the original purchaser of the fire protection products manufactured by HD FIRE and to any other person to whom such equipment is transferred, that such products will be free from defect in material and workmanship under normal use and care, for two (2) years from the date of shipment by HD FIRE. Products or Components supplied or used by HD FIRE, but manufactured by others, are warranted only to the extent of the manufacturer's warranty. No warranty is given for product or components which have been subject to misuse, improper installation, corrosion, unauthorized repair, alteration or un-maintained. HD FIRE shall not be responsible for system design errors or improper installation or inaccurate or incomplete information supplied by buyer or buyer's representatives. HD FIRE will repair or replace defective material free of charge, which is returned to our factory, transportation charge prepaid, provided after our inspection the material is found to have been defective at the time of initial shipment from our works. HD FIRE shall not be liable for any incidental or consequential loss, damage or expense arising directly or indirectly from the use of the product including damages for injury to person, damages to property and penalties resulting from any products and components manufactured by HD FIRE. HD FIRE shall not be liable for any damages or labour charges or expense in making repair or adjustment to the product. HD FIRE shall not be liable for any damages or charges sustained in the adaptation or use of its engineering data & services. In no event shall HD FIRE's product liability exceed an amount equal to the sale price.
The foregoing warranty is exclusive and in lieu of all other warranties and representation whether expressed, implied, oral or written, including but not limited to, any implied warranties or merchantability or fitness for a particular purpose. All such other warranties and representations are hereby cancelled.

NOTICE :
The equipment presented in this bulletin is to be installed in accordance with the latest publication standards of NFPA or other similar organisations and also with the provision of government codes or ordinances wherever applicable.
The information provided by us is to the best of our knowledge and belief, and consist of general guidelines only. Site handling and installation control is not in our scope. Hence we give no guarantee for result and take no liability for damages, loss or penalties whatsoever, resulting from our suggestion, information, recommendation or damages due to our product.
Product development is a continuous programme of HD FIRE PROTECT LIMITED. and hence the right to modify any specification without prior notice is reserved with the company.

HD FIRE PROTECT LIMITED
Protecting What Matters Most to You

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