



Technical Features

TANK MOUNTING TYPE	Vertical or Horizontal
CONCENTRATE STORAGE CAPACITY	<p>For Vertical Tank: 140 litres to 7500 litres (36 TO 2000 gallon (US))</p> <p>For Horizontal Tank: 140 litres to 15000 litres (36 to 4000 gallon (US))</p>
WORKING PRESSURE	30 psi (2.1 bar) to 175 psi (12 bar)
OPERATING TEMPERATURE	35.6°F (2°C) to 167°F (75°C)
FACTORY HYDRO TEST PRESSURE	As per ASME code
FLOW	Refer Ratio Controller Product Data Sheet
VESSEL CONSTRUCTION	Carbon Steel as per ASME Code Section VIII Div 1, for unfired pressure vessels
BLADDER	Buna-N
EXTERNAL PIPING	Water side: Carbon Steel Seamless Pipe Sch.40 Foam Concentrate side: Stainless Steel Sch.40
RATIO CONTROLLER	Wafer type with Stainless Steel 304/CF8 standard supply Optional: Stainless Steel 316/CF8M or Bronze Optional - Flanged Type

VENT AND DRAIN	Ball valve
APPROVALS	UL-Listed
OPTIONAL SUPPLY	Refer to page 3
FINISH	Red RAL 3001
ORDERING INFORMATION	Specify: <ol style="list-style-type: none"> 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 Approval Requirement

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.

LIFECO Bladder tanks and proportioners are UL Listed with various LIFECO foam concentrates, refer individual listing and approval data.

“U” stamp (The American Society of Mechanical Engineers- ASME) code stamp. This ASME certification 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

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. LIFECO 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. LIFECO product.

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) Multiple Ratio Controllers cannot be used if it is UL Listed Bladder tank.
- 7) Each tank is designed & tested for specific type of foam concentrate, hence specify in order the concentrate type to be used.
- 8) The system 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 CF8M
- 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

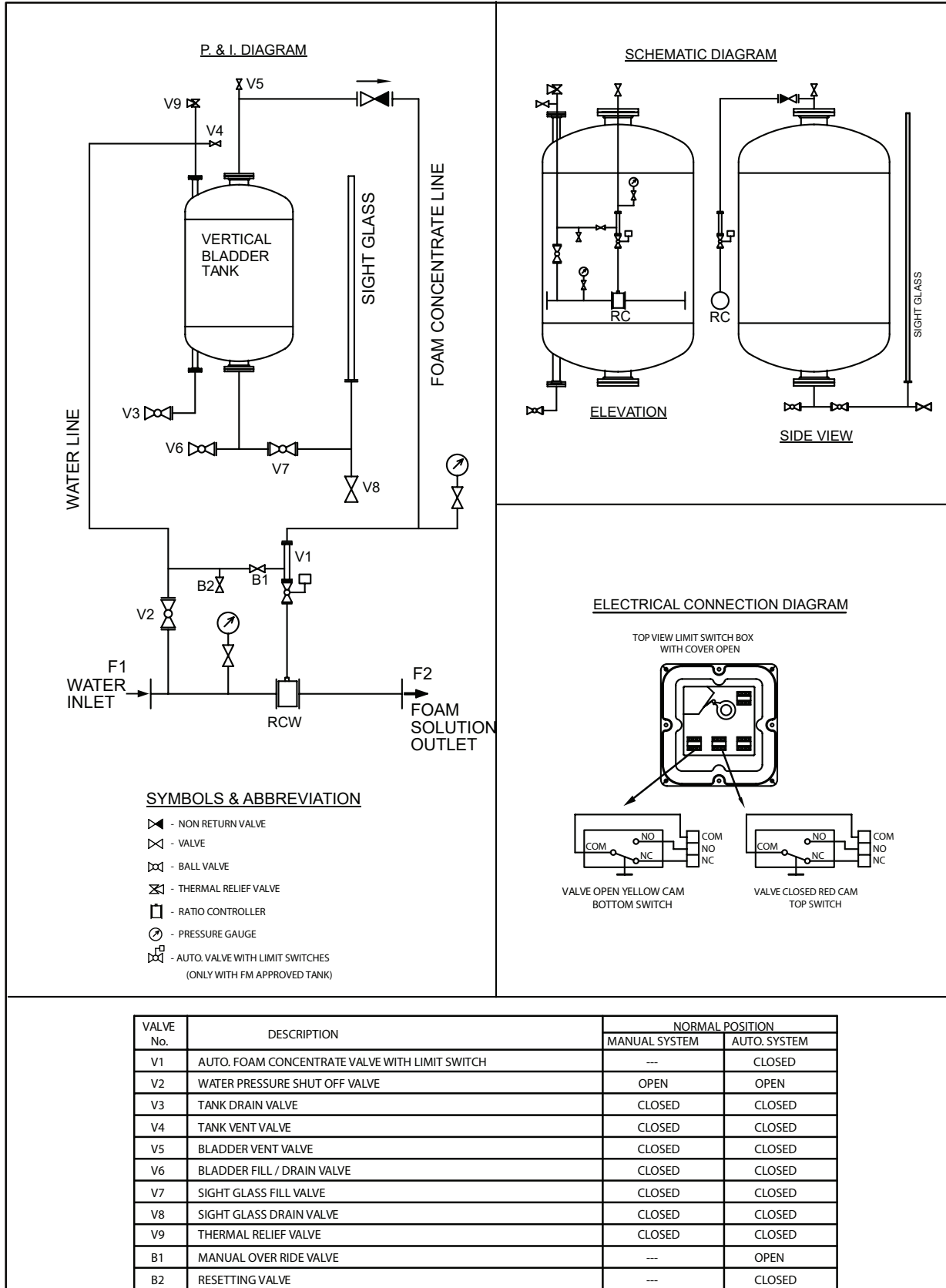
Listing & Approval

- 1) Bladder tank proportioning system is UL Listed as pre-piped system.
- 2) Listing and Approval is valid only when used in the manner as outlined in the applicable Listing and Approval.
- 4) CE marking is optional.
- 5) ASME “U” stamp is optional.

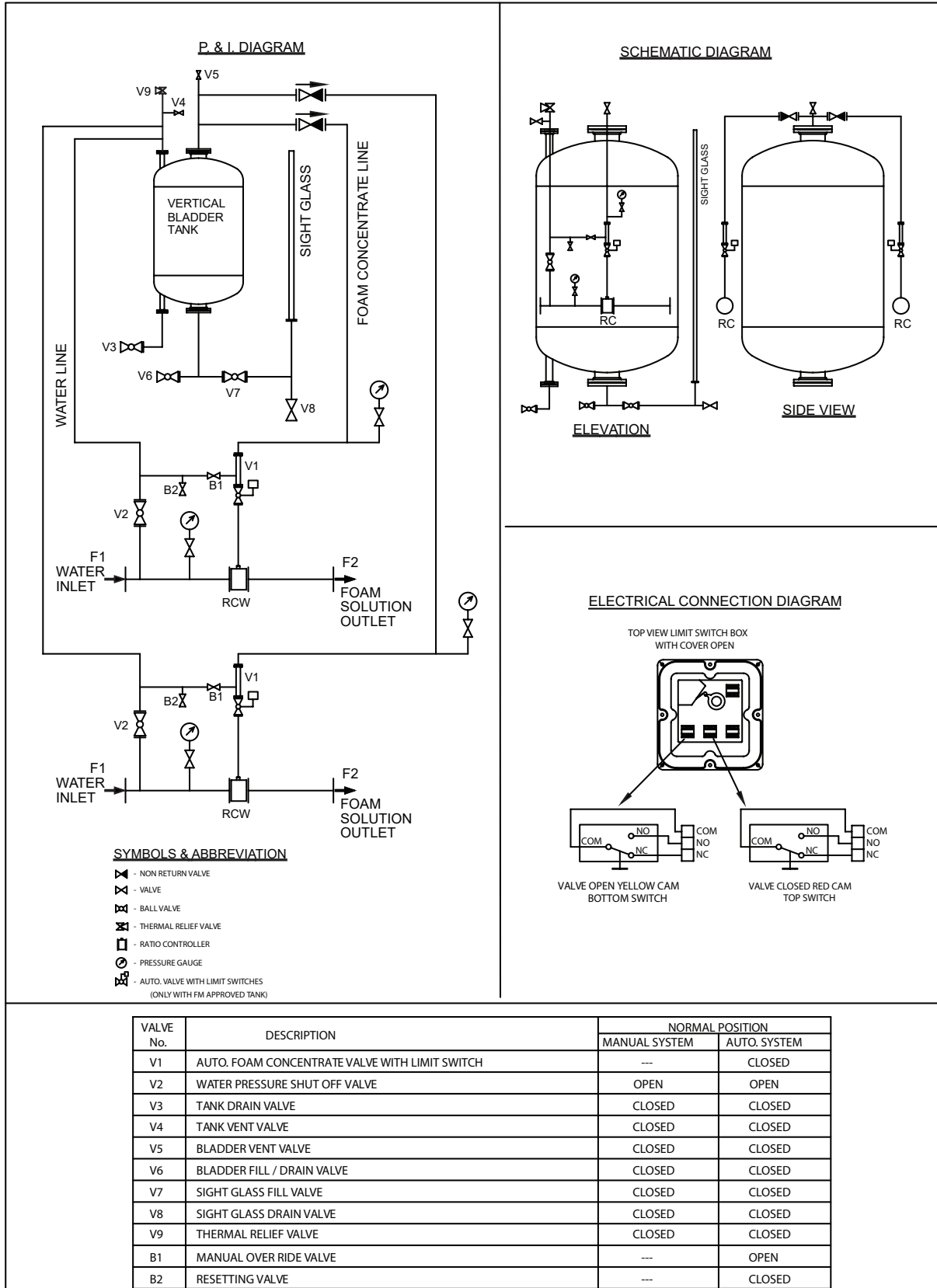
Shipping Details

- 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 with crate all over as standard packing system of LIFECO. For any custom packing requirement contact LIFECO Sales.

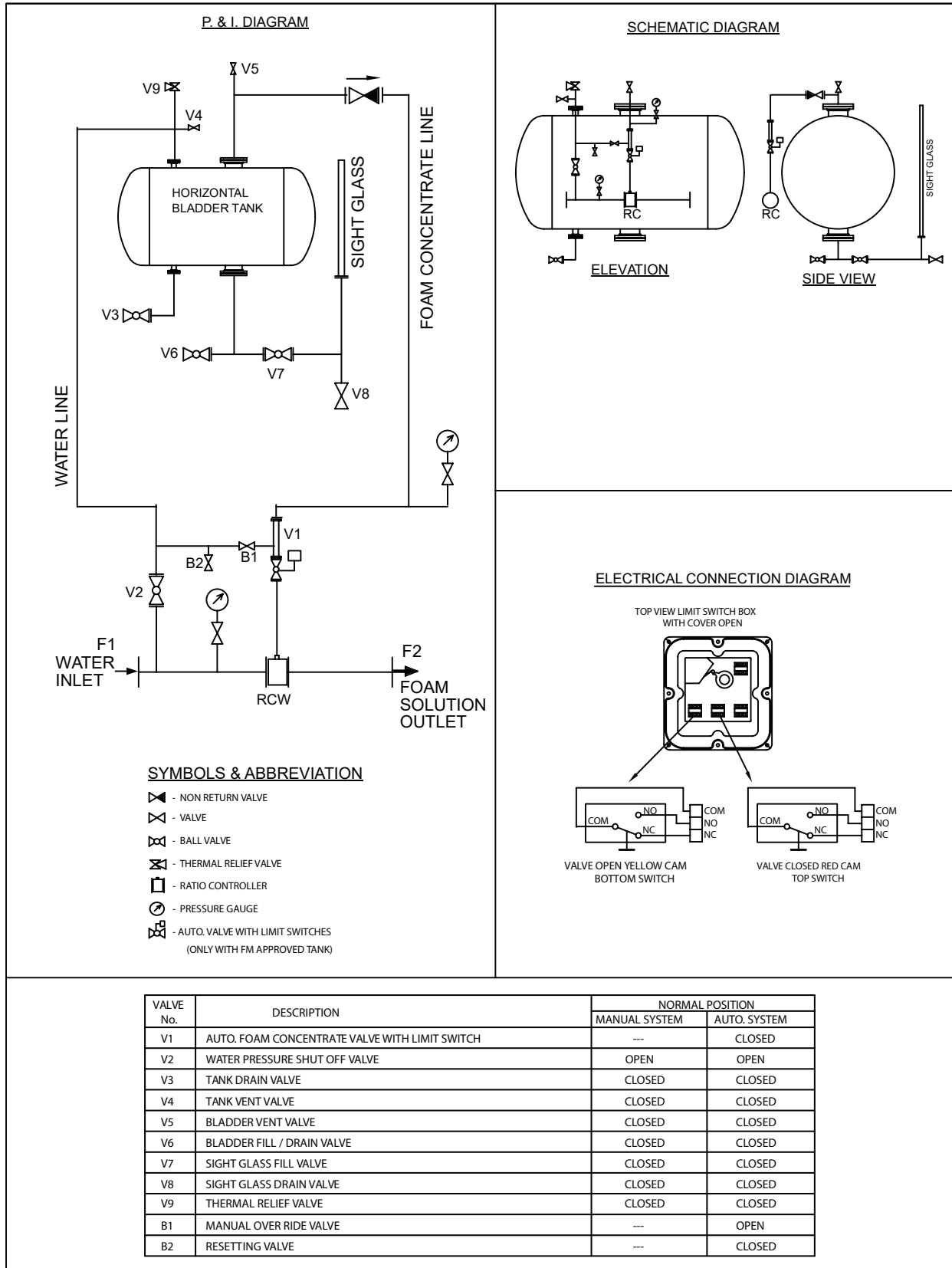
Vertical Bladder Tank with Single Ratio Controllers



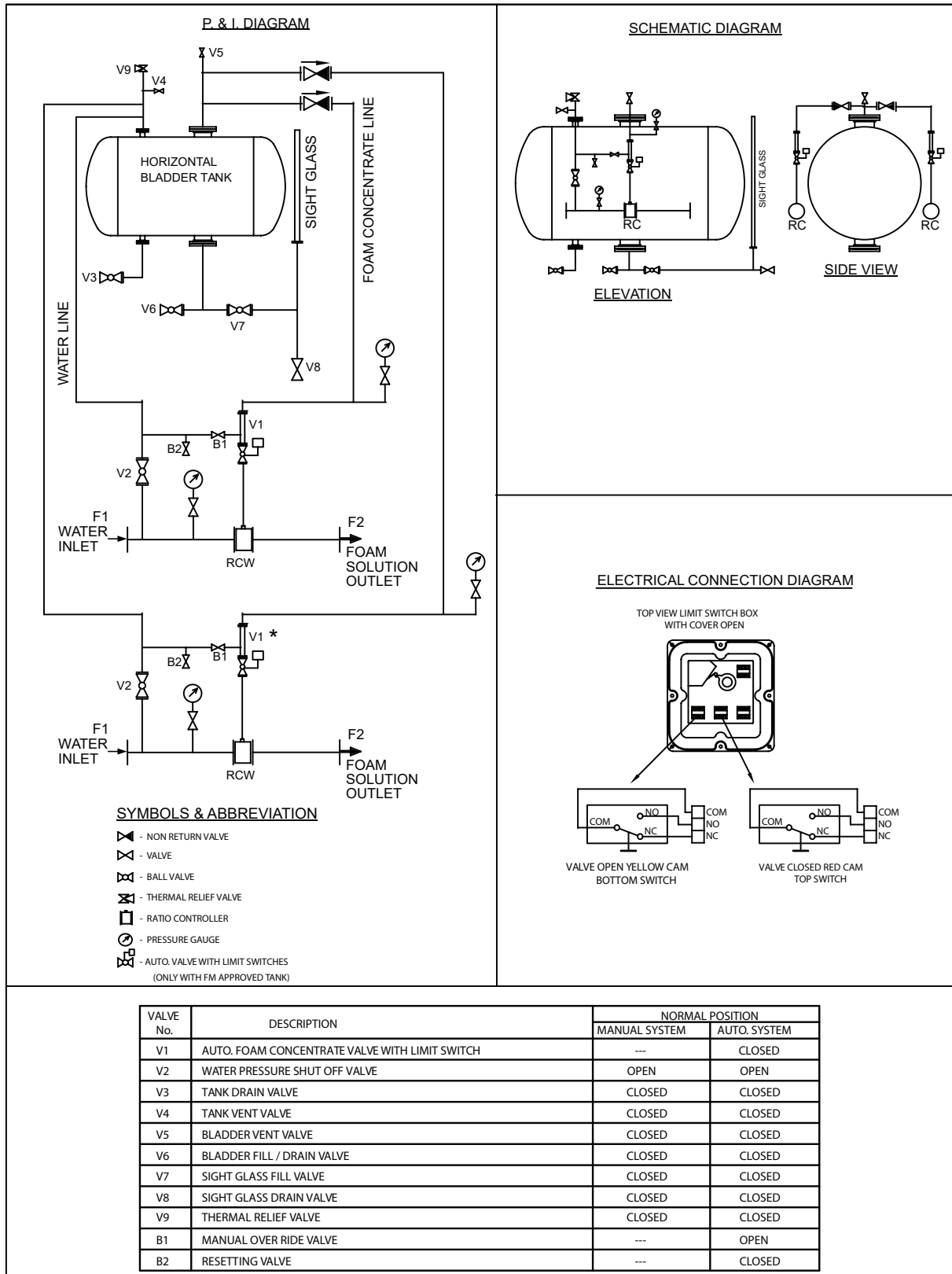
Vertical Bladder Tank with Two Ratio Controller



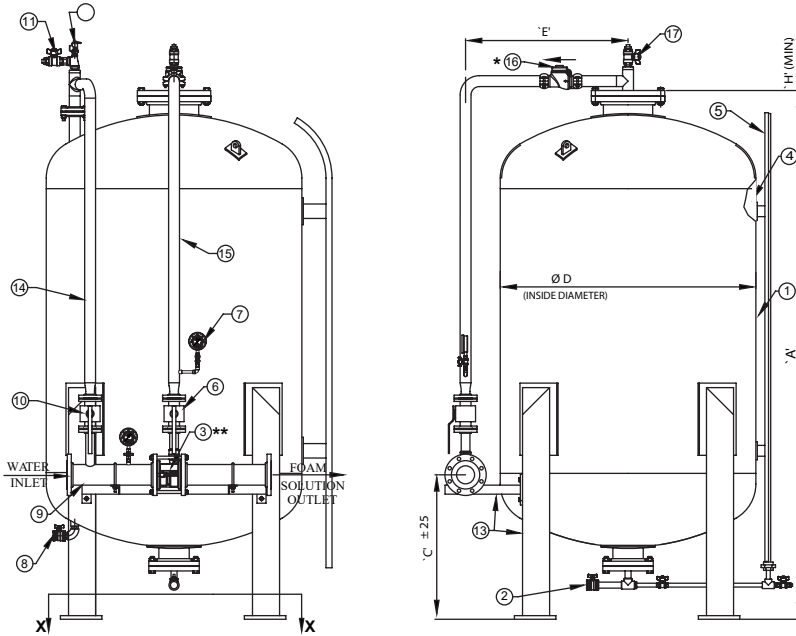
Horizontal Bladder Tank with Single Ratio Controller



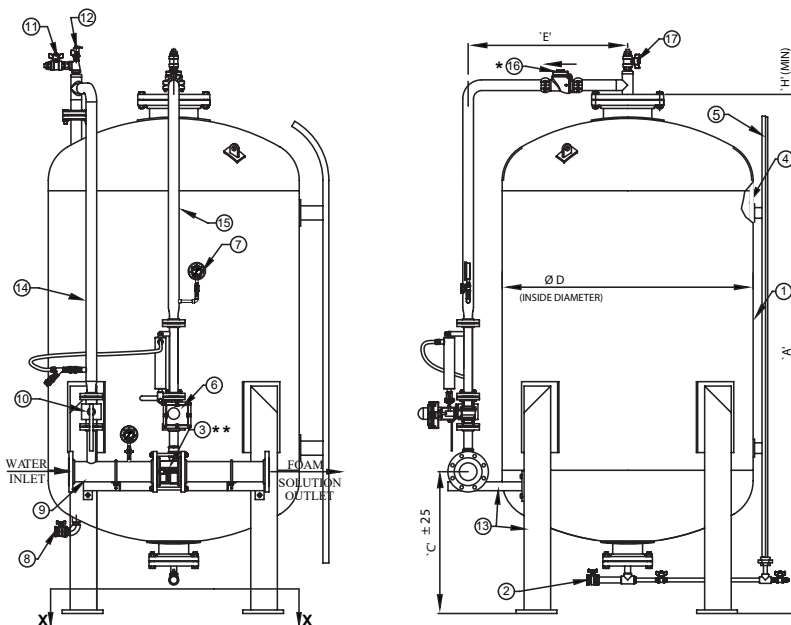
Horizontal Bladder Tank with Two Ratio Controller



Vertical Bladder Tank

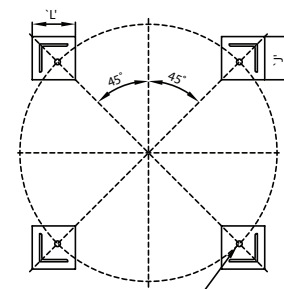


WITHOUT CONCENTRATE CONTROL VALVE



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'

SELECTION OF FOAM CONCENTRATE CONTROL VALVE FOR HORIZONTAL & VERTICAL BLADDER TANK

LIFECO 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

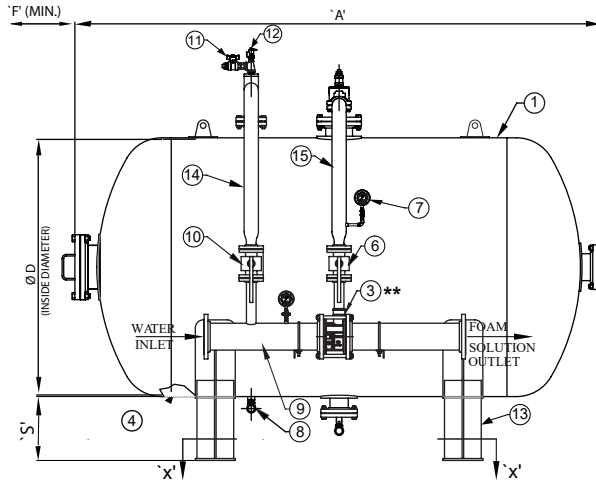
* GROOVED - STANDARD SUPPLY, FLANGED - OPTIONAL
** WAFER TYPE STANDARD SUPPLY, FLANGED - OPTIONAL

Capacity & Dimensional Chart for Vertical Bladder Tank

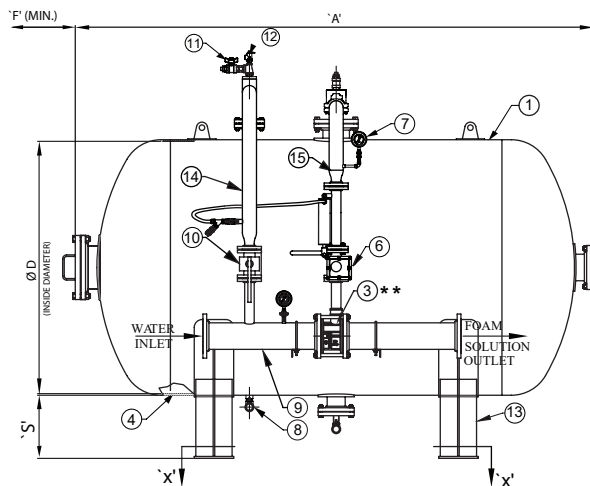
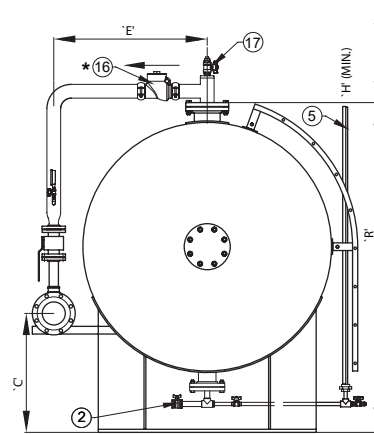
CAPACITY		Ø D (I.D.)	A	C	E	G	H (MIN.)	J	L	N
LITERS	GALLONS									
140	36	500	1418	525	500	462	1250	150	150	Ø 25
150	38	500	1466	525	500	462	1250	150	150	Ø 25
200	53	600	1423	575	500	560	1250	150	150	Ø 25
250	66	600	1618	575	500	560	1450	150	150	Ø 25
300	75	600	1811	575	500	560	1640	150	150	Ø 25
350	92	600	2006	575	500	560	1835	150	150	Ø 25
400	100	600	2200	575	500	560	2030	150	150	Ø 25
450	120	750	1790	625	580	710	1625	200	200	Ø 25
500	135	750	1915	625	580	710	1750	200	200	Ø 25
550	145	750	2039	625	580	710	1875	200	200	Ø 25
600	150	750	2164	625	580	710	2000	200	200	Ø 25
650	175	850	1947	675	625	810	1780	200	200	Ø 25
700	200	850	2044	675	625	810	1875	200	200	Ø 25
750	200	850	2141	675	625	810	1975	200	200	Ø 25
800	215	850	2237	675	625	810	2070	200	200	Ø 25
850	225	850	2334	675	625	810	2165	200	200	Ø 25
900	240	850	2431	675	625	810	2265	200	200	Ø 25
950	250	850	2528	675	625	810	2360	200	200	Ø 25
1000	265	1000	2112	750	700	960	1950	200	200	Ø 30
1100	290	1000	2252	750	700	960	2090	200	200	Ø 30
1200	300	1000	2392	750	700	960	2230	200	200	Ø 30
1300	325	1000	2532	750	700	960	2370	200	200	Ø 30
1400	350	1000	2672	750	700	960	2510	200	200	Ø 30
1500	375	1000	2813	750	700	960	2650	200	200	Ø 30
1600	400	1000	2953	750	700	960	2790	200	200	Ø 30
1700	450	1000	3093	750	700	960	2930	200	200	Ø 30
1800	475	1200	2502	800	800	1160	2330	230	230	Ø 30
1900	500	1200	2599	800	800	1160	2430	230	230	Ø 30
2000	530	1200	2696	800	800	1160	2525	230	230	Ø 30
2200	580	1200	2891	800	800	1160	2720	230	230	Ø 30
2400	600	1200	3085	800	800	1160	2915	230	230	Ø 30
2600	700	1200	3280	800	800	1160	3110	230	230	Ø 30
2800	750	1200	3474	800	800	1160	3300	230	230	Ø 30
3000	800	1400	2927	800	900	1370	2750	230	230	Ø 30
3250	850	1400	3106	800	900	1370	2930	230	230	Ø 30
3500	900	1400	3284	800	900	1370	3110	230	230	Ø 30
3750	1000	1400	3463	800	900	1370	3290	230	230	Ø 30
4000	1050	1400	3642	800	900	1370	3465	230	230	Ø 30
4250	1100	1600	3146	800	1000	1500	2975	300	300	Ø 30
4500	1200	1600	3283	800	1000	1500	3110	300	300	Ø 30
4750	1250	1600	3419	800	1000	1500	3250	300	300	Ø 30
5000	1300	1600	3556	800	1000	1500	3385	300	300	Ø 30
5250	1400	1600	3693	800	1000	1500	3525	300	300	Ø 30
5500	1450	1725	3431	800	1060	1640	3255	300	300	Ø 30
5750	1500	1725	3548	800	1060	1640	3370	300	300	Ø 30
6000	1600	1725	3666	800	1060	1640	3490	300	300	Ø 30
6250	1650	1725	3784	800	1060	1640	3610	300	300	Ø 30
6500	1700	1725	3901	800	1060	1640	3720	300	300	Ø 30
6750	1800	1725	4019	800	1060	1640	3850	300	300	Ø 30
7000	1850	1725	4137	800	1060	1640	3960	300	300	Ø 30
7250	1900	1725	4254	800	1060	1640	4080	300	300	Ø 30
7500	2000	1725	4372	800	1060	1640	4200	300	300	Ø 30



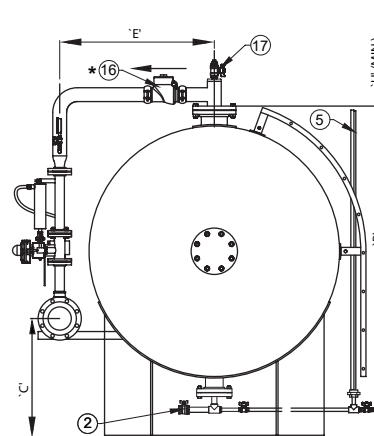
Horizontal Bladder Tank



WITHOUT CONCENTRATE CONTROL VALVE



WITH CONCENTRATE CONTROL VALVE

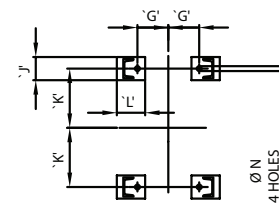


SR.NO.	DESCRIPTION	MATERIAL SPECIFICATION
1	TANK	SA 516 GR. 70 (OR EQUIVALENT)
2	BLADDER FILL/ DRAIN VALVE	BRASS
3	RATIO CONTROLLER **	SS 304 / BRONZE / SS 316
4	BLADDER	BUNA-N
5	SIGHT GLASS	POLYCARBONATE
6	FOAM CONC. SHUT OFF VALVE	SS 304
7	PRESSURE GAUGE	STD. 0 TO 300 PSI
8	TANK DRAIN VALVE	BRASS
9	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

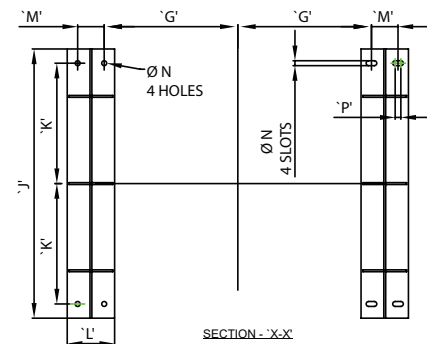
* GROOVED - STANDARD SUPPLY, FLANGED - OPTIONAL

** WAFER TYPE STANDARD SUPPLY, FLANGED - OPTIONAL

NOTE: CONCENTRATE CONTROL VALVE IS MANDATORY WITH FM APPROVED PRODUCT



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



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

Capacity & Dimensional Chart for Horizontal Bladder Tank

CAPACITY		Ø D (I.D.)	A	C	E	F (MIN)	G	H (MIN)	J	K	L	M	N	P	R	S
LITERS	GALLONS															
200	53	600	1146	550	500	1250	120	875	90	230	110	-	Ø19	-	1142	400
250	66	600	1341	550	500	1445	215	875	90	230	110	-	Ø19	-	1142	400
300	75	600	1535	550	500	1640	315	875	90	230	110	-	Ø19	-	1142	400
350	92	600	1730	550	500	1835	410	875	90	230	110	-	Ø19	-	1142	400
400	100	600	1924	550	500	2030	510	875	90	230	110	-	Ø19	-	1142	400
450	120	750	1519	575	580	1610	260	1125	120	245	130	-	Ø19	-	1293	400
500	135	750	1644	575	580	1735	320	1125	120	245	130	-	Ø19	-	1293	400
550	145	750	1768	575	580	1860	385	1125	120	245	130	-	Ø19	-	1293	400
600	150	720	1893	575	580	1985	445	1125	120	245	130	-	Ø19	-	1293	400
650	175	850	1678	625	625	1770	300	1230	120	310	140	-	Ø19	-	1394	400
700	185	850	1775	625	625	1870	350	1230	120	310	140	-	Ø19	-	1394	400
750	200	850	1872	625	625	1965	400	1230	120	310	140	-	Ø19	-	1394	400
800	215	850	1968	625	625	2060	445	1230	120	310	140	-	Ø19	-	1394	400
850	225	850	2065	625	625	2160	495	1230	120	310	140	-	Ø19	-	1394	400
900	240	850	2162	625	625	2255	540	1230	120	310	140	-	Ø19	-	1394	400
950	250	850	2259	625	625	2350	590	1230	120	310	140	-	Ø19	-	1394	400
1000	265	1000	1848	675	700	1945	320	1370	170	360	185	-	Ø22	-	1542	400
1100	290	1000	1988	675	700	2085	385	1370	170	360	185	-	Ø22	-	1542	400
1200	300	1000	2128	675	700	2225	430	1370	170	360	185	-	Ø22	-	1542	400
1300	325	1000	2268	675	700	2365	500	1370	170	360	185	-	Ø22	-	1542	400
1400	350	1000	2408	675	700	2500	570	1370	170	360	185	-	Ø22	-	1542	400
1500	375	1000	2548	675	700	2640	600	1370	170	360	185	-	Ø22	-	1542	400
1600	400	1000	2689	675	700	2785	675	1370	170	360	185	-	Ø22	-	1542	400
1700	450	1000	2829	675	700	2925	750	1370	170	360	185	-	Ø22	-	1542	400
1800	475	1200	2234	700	800	2330	500	1575	1067	450	135	-	Ø26 2 Holes	30 2 Slots	1745	400
1900	500	1200	2331	700	800	2430	550	1575	1067	450	135	-	Ø26 2 Holes	30 2 Slots	1745	400
2000	530	1200	2428	700	800	2525	600	1575	1067	450	135	-	Ø26 2 Holes	30 2 Slots	1745	400
2200	580	1200	2623	700	800	2720	675	1575	1067	450	135	-	Ø26 2 Holes	30 2 Slots	1745	400
2400	600	1200	2817	700	800	2915	685	1575	1050	450	250	140	Ø26	30	1745	400
2600	700	1200	3012	700	800	3110	755	1575	1050	450	250	140	Ø26	30	1745	400
2800	750	1200	3206	700	800	3300	830	1575	1050	450	250	140	Ø26	30	1745	400
3000	800	1400	2659	650	900	2755	535	1775	1250	550	250	140	Ø26	30	1946	400
3250	850	1400	2838	650	900	2835	620	1775	1250	550	250	140	Ø26	30	1946	400
3500	900	1400	3016	650	900	3110	710	1775	1250	550	250	140	Ø26	30	1946	400
3750	1000	1400	3195	650	900	3290	780	1775	1250	550	250	140	Ø26	30	1946	400
4000	1050	1400	3374	650	900	3470	860	1775	1250	550	250	140	Ø26	30	1946	400
4250	1100	1400	3552	650	900	3645	940	1775	1250	550	250	140	Ø26	30	1946	400
4500	1200	1400	3731	650	900	3825	1020	1775	1250	550	250	140	Ø26	30	1946	400
4750	1250	1400	3910	650	900	4005	1100	1775	1250	550	250	140	Ø26	30	1946	400
5000	1300	1600	3287	775	1000	3380	705	1980	1420	635	250	140	Ø26	30	2149	400
5250	1400	1600	3424	775	1000	3515	775	1980	1420	635	250	140	Ø26	30	2149	400
5500	1450	1600	3561	775	1000	3655	845	1980	1420	635	250	140	Ø26	30	2149	400
5750	1500	1600	3697	775	1000	3790	915	1980	1420	635	250	140	Ø26	30	2149	400
6000	1600	1600	3834	775	1000	3930	985	1980	1420	635	250	140	Ø26	30	2149	400
6250	1650	1600	3971	775	1000	4065	1055	1980	1420	635	250	140	Ø26	30	2149	400
6500	1700	1600	4108	775	1000	4205	1125	1980	1420	635	250	140	Ø26	30	2149	400
6750	1800	1600	4245	775	1000	4340	1195	1980	1420	635	250	140	Ø26	30	2149	400
7000	1850	1600	4381	775	1000	4475	1265	1980	1420	635	250	140	Ø26	30	2149	400
7250	1900	1600	4518	775	1000	4615	1335	1980	1420	635	250	140	Ø26	30	2149	400
7500	2000	1600	4655	775	1000	4750	1405	1980	1420	635	250	140	Ø26	30	2149	400
7750	2050	1725	4220	675	1060	4315	1050	2100	1530	690	350	200	Ø26	30	2174	300
8000	2100	1725	4337	675	1060	4435	1110	2100	1530	690	350	200	Ø26	30	2174	300
8250	2200	1725	4455	675	1060	4550	1170	2100	1530	690	350	200	Ø26	30	2174	300
8500	2250	1725	4573	675	1060	4670	1240	2100	1530	690	350	200	Ø26	30	2174	300
8750	2300	1725	4690	675	1060	4785	1290	2100	1530	690	350	200	Ø26	30	2174	300
9000	2400	1725	4808	675	1060	4905	1320	2100	1530	690	350	200	Ø26	30	2174	300
9250	2450	1725	4926	675	1060	5020	1380	2100	1530	690	350	200	Ø26	30	2174	300
9500	2500	1725	5043	675	1060	5140	1440	2100	1530	690	350	200	Ø26	30	2174	300
9750	2600	1725	5161	675	1060	5256	1500	2100	1530	690	350	200	Ø26	30	2174	300
10000	2700	1725	5279	675	1060	5375	1365	2100	1530	690	350	200	Ø26	30	2174	300
10500	2800	1725	5514	675	1060	5610	1480	2100	1530	690	350	200	Ø26	30	2174	300
11000	2900	1725	5749	675	1060	5845	1600	2100	1530	690	350	200	Ø26	30	2174	300
11500	3000	1725	5985	675	1060	6080	1700	2100	1530	690	350	200	Ø26	30	2174	300
12000	3100	1725	6220	675	1060	6315	1700	2100	1530	690	350	200	Ø26	30	2174	300
12500	3300	1725	6455	675	1060	6550	1815	2100	1530	690	350	200	Ø26	30	2174	300
13000	3400	1725	6691	675	1060	6790	1935	2100	1530	690	350	200	Ø26	30	2174	300
13500	3500	1725	6926	675	1060	7021	2050	2100	1530	690	350	200	Ø26	30	2174	300
14000	3700	1725	7162	675	1060	7260	2170	2100	1530	690	350	200	Ø26	30	2174	300
14500	3800	1725	7397	675	1060	7495	2300	2100	1530	690	350	200	Ø26	30	2174	300
15000	3900	1725	7632	675	1060	7730	2300	2100	1530	690	350	200	Ø26	30	2174	300

Note:

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 with 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.