



HYDROFIRE ΕΠΕ

Buildings - Industry - Marine – Waterworks

END OF AG. PANTELEIMONOS Str. (ELEONAS)
GR-12241 EGALEO,

Tel.: +30 210 3412 749-750 Fax: +30 210 3412 406

www.hydrofire.gr, email: info@hydrofire.gr

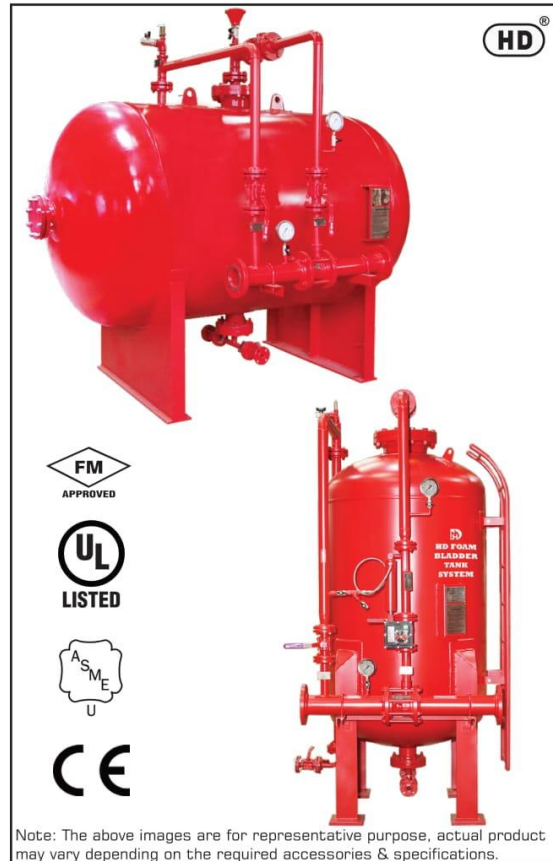


BLADDER TANK PROPORTIONING SYSTEM PRE-PIPED



TECHNICAL DATA

TANK MOUNTING TYPE	Vertical or Horizontal
CONCENTRATE STORAGE CAPACITY	For Vertical Tank 140 liters to 7500 liters (36 TO 2000 Gallon (US)) For Horizontal Tank 140 liters to 15000 liters (36 to 4000 Gallon (US))
MAXIMUM WORKING PRESSURE	12 Bar (175PSI)
FACTORY HYDRO TEST PRESSURE	As per ASME code
FLOW	Refer Ratio Controller Product Data Sheet-HD 263
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 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 or FM Approved
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



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.



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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 tubes(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.



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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/sqcm) required during filling procedure, to be arranged by installer / user.
- 3) Water supply at 0-1.5 kg/sqcm required for tank filling during commissioning, to be arranged by installer / user.
- 4) Concentrate fill pump need 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 of Bladder tank is applicable only if FM Approved Bladder tank, Ratio Controller, Foam Concentrate and Discharge Devices are installed.
- 7) Foam Concentrate Control Valve is requirement for FM Approval and is not permitted 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 permits maximum two Ratio Controllers.
- 10) Each tank is designed & tested for specific type of foam concentrate, hence specify in order the concentrate type to be used.

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



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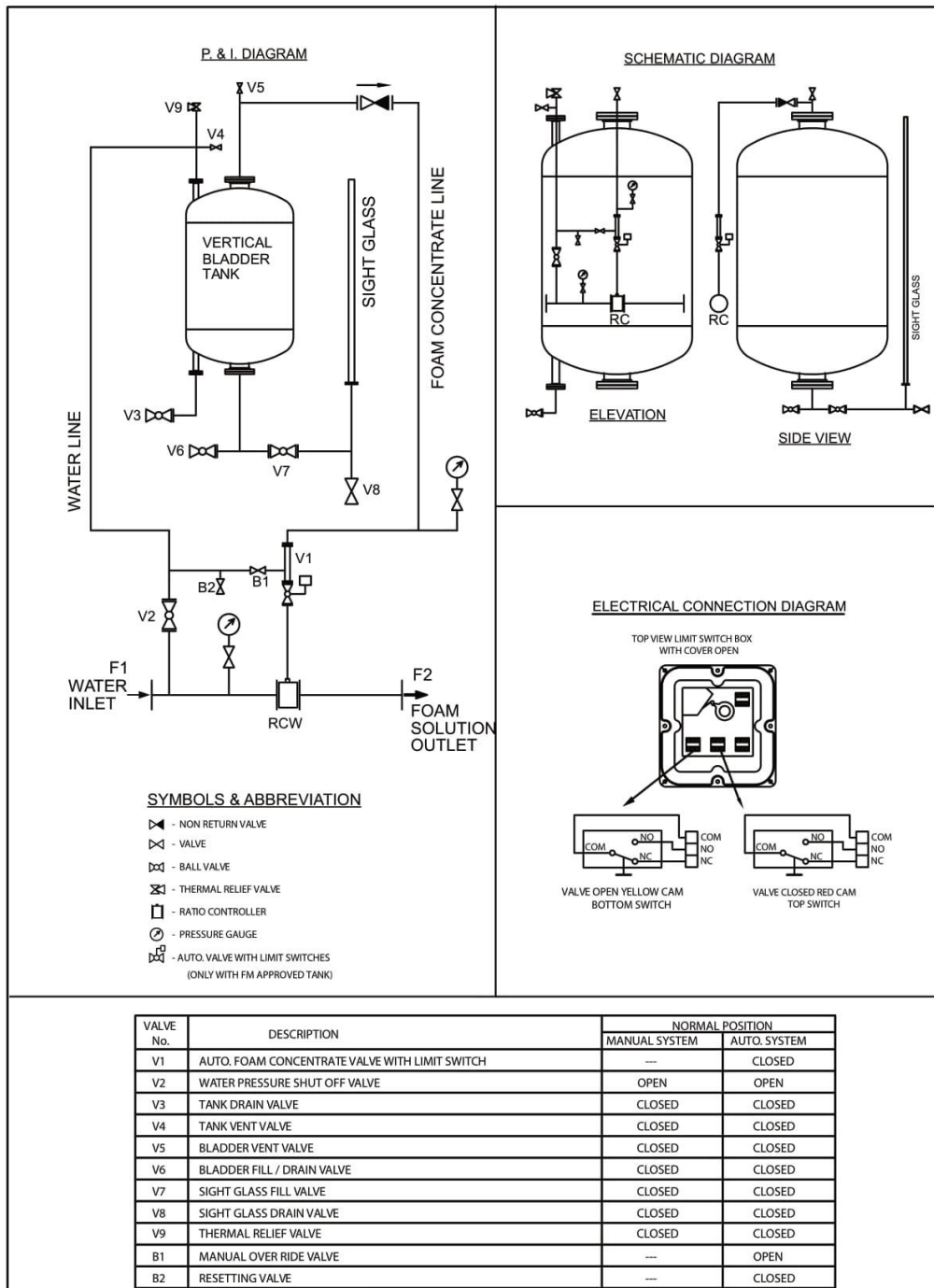
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VERTICAL BLADDER TANK WITH SINGLE RATIO CONTROLLER





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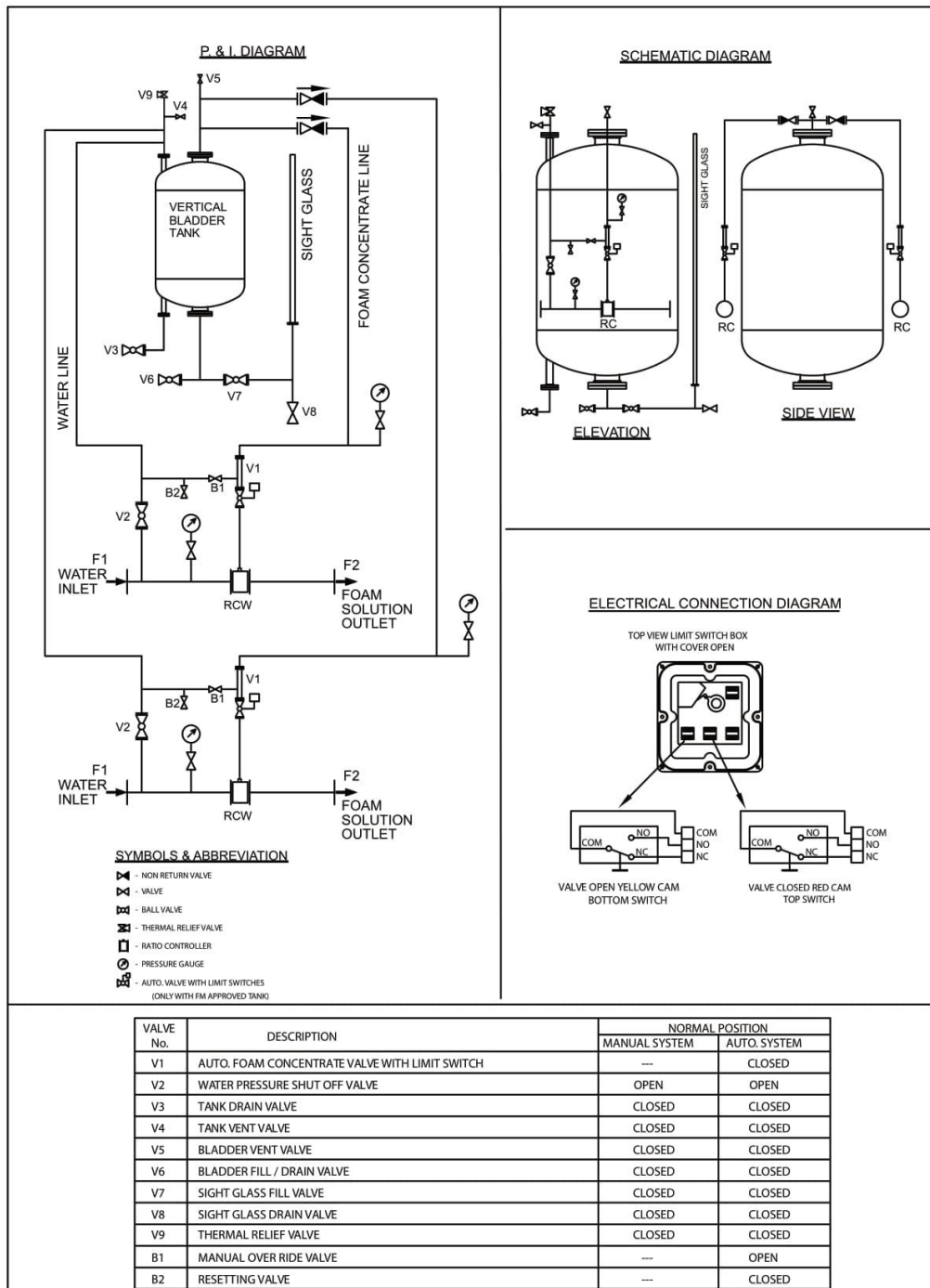
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VERTICAL BLADDER TANK WITH TWO RATIO CONTROLLERS





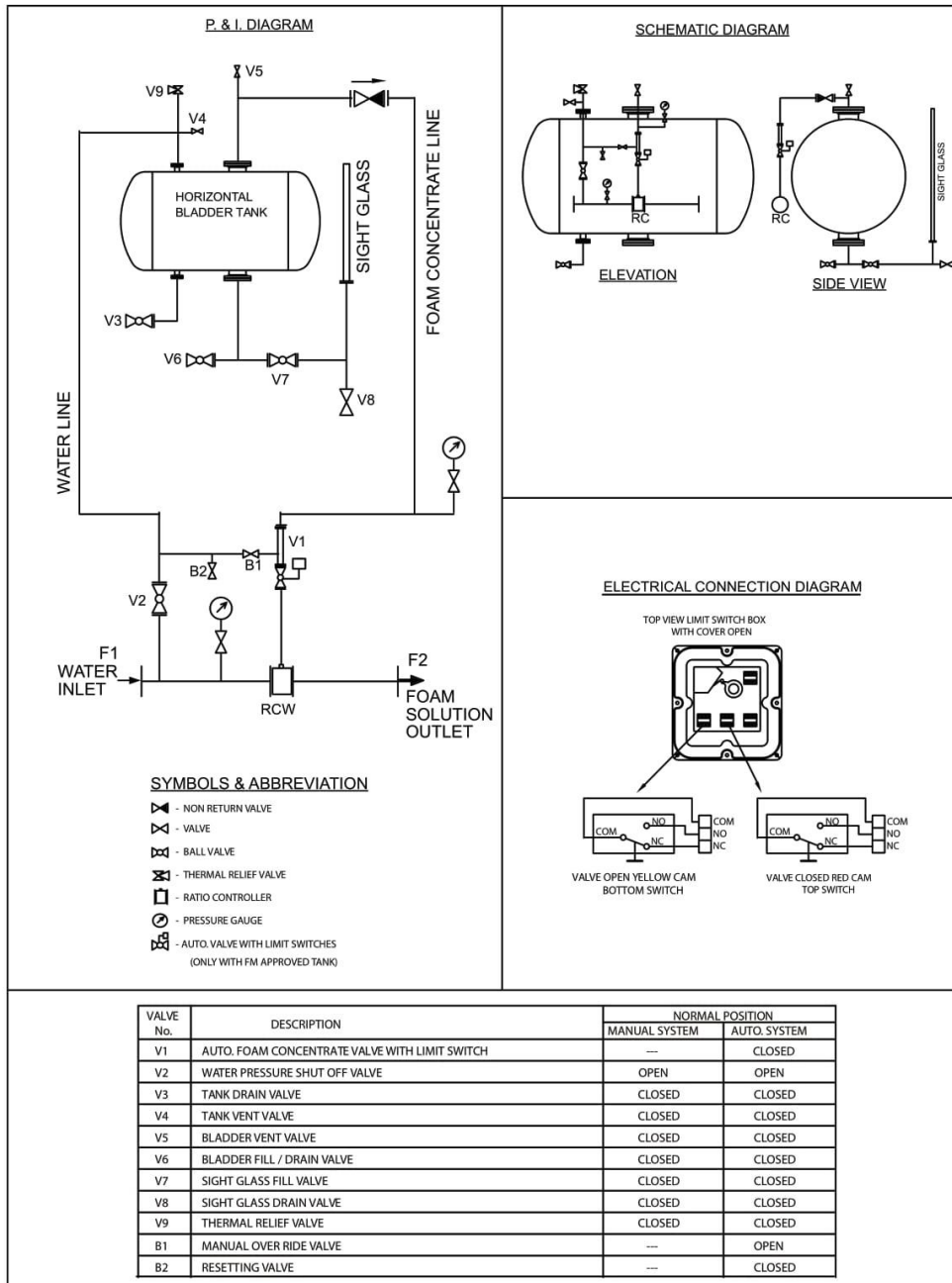
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HORIZONTAL BLADDER TANK WITH SINGLE RATIO CONTROLLER





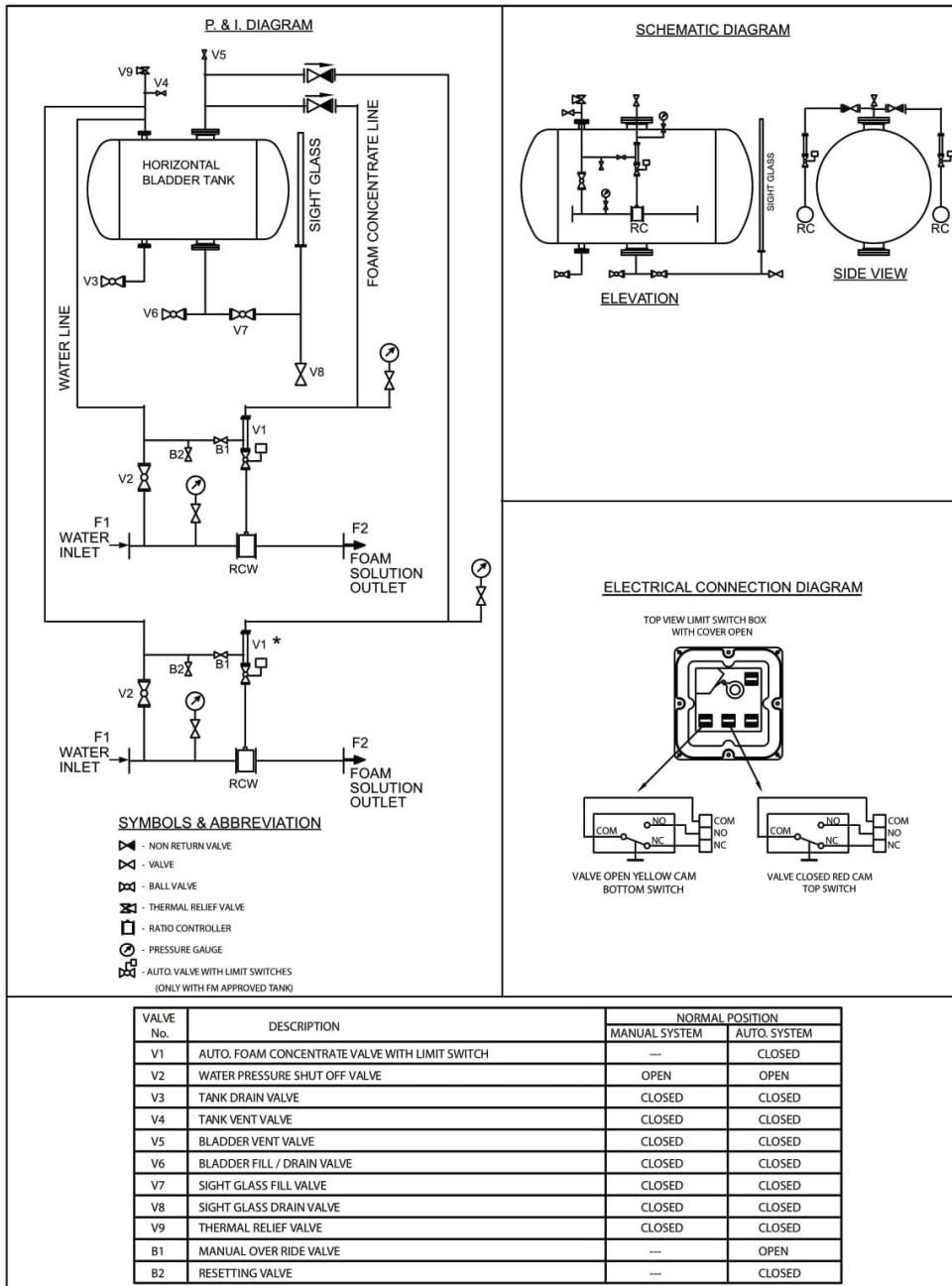
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HORIZONTAL BLADDER TANK WITH TWO RATIO CONTROLLER





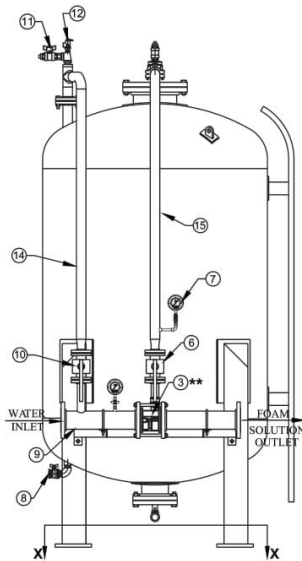
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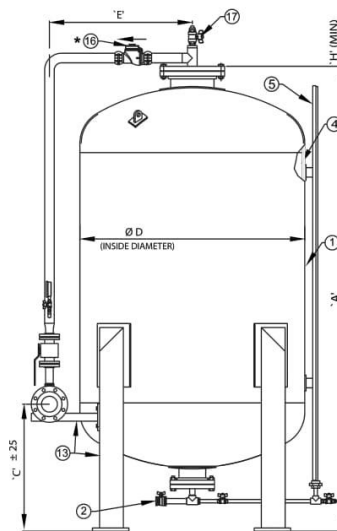
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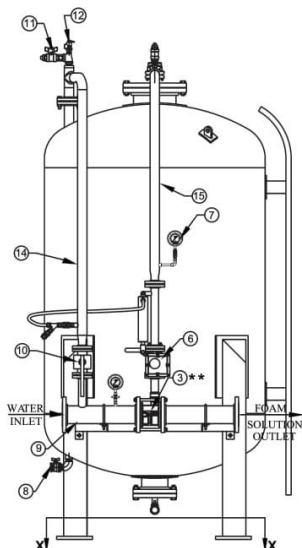
VERTICAL BLADDER TANK



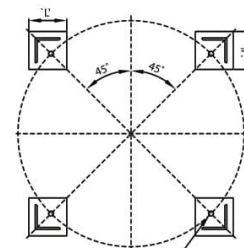
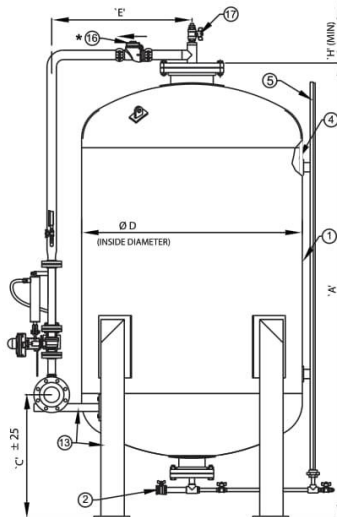
WITHOUT CONCENTRATE CONTROL VALVE



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



WITH CONCENTRATE CONTROL VALVE



SECTION - 'X-X'

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

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



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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



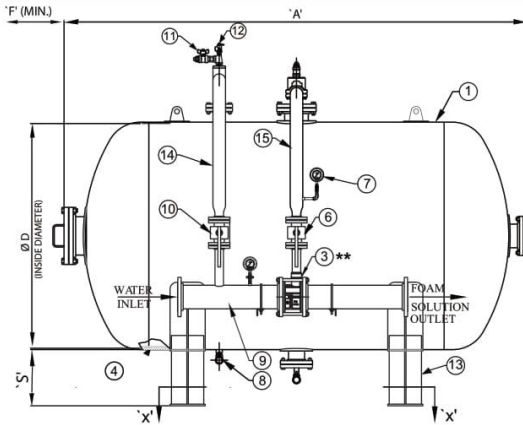
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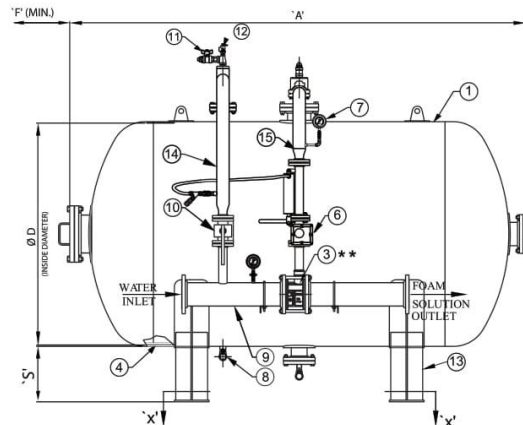
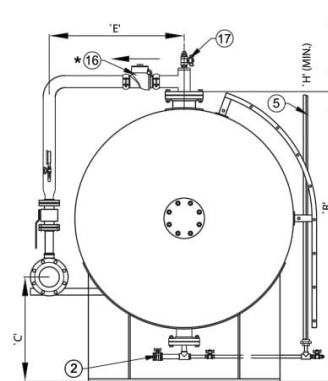
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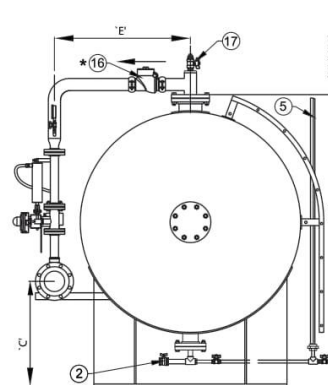
HORIZONTAL BLADDER TANK



WITHOUT CONCENTRATE CONTROL VALVE



WITH CONCENTRATE CONTROL VALVE

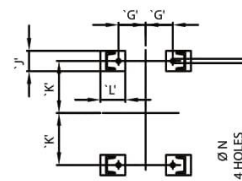


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1	TANK	SA 516 GR.70 (OR EQUIVALENT)
2	BLADDER FILL/ DRAIN VALVE	BRASS
3	RATIO CONTROLLER **	SS 304 / BRONZE / SS 316
4	BLADDER	BUNA-N
5	SIGHT GLASS	POLYCARBONATE
6	FOAM CONC. SHUT OFF VALVE	SS 304
7	PRESSURE GAUGE	STD. 0 TO 300 PSI
8	TANK DRAIN VALVE	BRASS
9	SPOOL PIECE	A106 SEAMLESS, SCH.40
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17	BLADDER VENT VALVE	BRASS

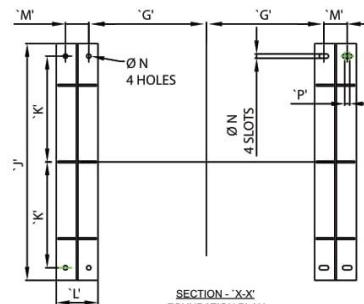
* GROOVED - STANDARD SUPPLY, FLANGED - OPTIONAL

** 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)



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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 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 PVT. LTD. and hence the right to modify any specification without prior notice is reserved with the company.



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