

Vertical Bladder Tanks

Features

- UL Listed and FM Approved for use with various ANSUL® proportioners and foam concentrates
- 175 psi (12.1 bar) maximum allowable working pressure (design pressure)
- Nominal capacities up to 2,000 gal with larger tanks available on special request
- Tanks up to 800 gal meet the requirements for Seismic Zone 4 earthquake resistant design
- Available with brass or 316 stainless steel trim piping and valves
- Options for grooved, NPT, and flanged connections
- Choice of standard or corrosion-resistant epoxy exterior paint, available in a variety of colors
- Optional sight gauge and thermal pressure relief valves available

Application

The ANSUL® Vertical Bladder Tank is one component of a balanced pressure proportioning system. ANSUL® Vertical Bladder Tanks require only a pressurized water supply for operation. No other external power is required. They can be used with one or more ANSUL® proportioners and any suitable discharge device to create a complete foam system. ANSUL® Vertical Bladder Tanks can be used with most ANSUL® foam concentrates.

ANSUL® Vertical Bladder Tanks have numerous applications including aircraft hangars, foam-water sprinkler systems, truck loading racks, and helipads.

Description

The ANSUL® Vertical Bladder Tank is a steel pressure vessel, which stores a foam concentrate within an elastomeric bladder. The concentrate is discharged from the tank by incoming water applying pressure to the bladder. This applied energy is transferred to the concentrate, supplying pressurized concentrate to the proportioner. Proportioners are separate items described on a separate data sheet.

Trim piping and connections

ANSUL® Vertical Bladder Tanks are available in vertical models up to 2,000 gal. All models feature top discharge foam concentrate connections, right and left hand water inlet connections, and the option to pipe using either grooved or NPT threaded connections. Adapters for flanged connections are available separately. Trim piping is available in brass or stainless steel. All valves are clearly identified by permanently attached nameplates and can be secured in position with included ring pins and tamper seals.



Protective coatings

All ANSUL® Vertical Bladder Tanks feature a high-build epoxy internal coating. Exterior paint is available in two grades: Standard and Corrosion-Resistant Epoxy (Epoxy CR). Paint systems used on ANSUL® Vertical Bladder Tanks have been subjected to and passed salt spray corrosion testing per ASTM B117-90. Standard paint has been tested to a minimum of 240 hours in accordance with UL 162, UL Subject 139, and FM 5130. Epoxy CR paint has been tested to a minimum of 3,000 hours and is suitable for marine and offshore use.

Support and mounting

Vertical tanks are supported on four legs with foot plates and slotted holes for mounting. Refer to dimensional drawings for mounting hole spacing.

Each tank is fitted with two lifting lugs designed to lift the empty weight of the tank with a minimum safety factor of 2 when utilizing appropriate slings rigged at a lifting angle of not less than 30° from horizontal. All lifting lugs have a minimum clear hole size of 2 in. (50 mm).

Internal components

ANSUL® Vertical Bladder Tanks contain an elastomeric bladder that has been approved for use by Underwriter's Laboratory and FM Approvals for use with ANSUL® foam concentrates. ANSUL® Vertical Bladder Tanks utilize center tubes to facilitate agent discharge. Center tubes are constructed of materials compatible with ANSUL® foam concentrates. Vertical tanks utilize a single center tube.

Sight gauge

A sight gauge is available as an optional accessory for ANSUL® Vertical Bladder Tanks for estimation of the fill level in the tank. The sight gauge is equipped with a clear 1 in. PVC tube. The sight gauge is shipped as a loose item and must be assembled on the tank during installation.

Description

Thermal relief valve

A thermal relief valve is available as an option for ANSUL® Vertical Bladder Tanks. A thermal relief valve should be used when the bladder tank will be stored in an isolated/hydraulically locked condition in order to relieve pressure due to thermal expansion. This valve is factory set to 175 psi (12.1 bar) and it is recommended that the design pressure of the system be maintained at least 5 psi (0.34 bar) or 10% below the set pressure of the valve to avoid seat leakage and early valve maintenance. This valve is **not** a substitute for a properly sized ASME pressure relief valve to protect the entire system from overpressure.

ASME information

The ANSUL® Vertical Bladder Tank is designed and constructed in accordance with the latest revisions to ASME Code Section VIII, Division 1 for unfired pressure vessels with a maximum allowable working pressure (MAWP) of 175 psi (12.1 bar) and tested to the pressure specified by the applicable codes and standards. Tanks designed to ASME code are tested to at least 230 psi (15.9 bar). CE marked tanks are tested to at least 255 psi (17.6 bar). All ANSUL® Vertical Bladder Tanks are constructed of steel complying with ASME specifications. Tank heads are 2:1 elliptical unless otherwise specified.

All ANSUL® Vertical Bladder Tanks include a permanently affixed stainless steel ASME data plate. At a minimum, the data plate includes the following information: year of manufacture, maximum allowable working pressure (MAWP), nominal volume, part number, National Board number, minimum material thickness, minimum design metal temperature (MDMT), and type of head used.

Approvals and certifications

ANSUL® Vertical Bladder Tanks are UL Listed and FM Approved for use with various ANSUL® foam concentrates and proportioners. The UL mark and FM Approval diamond are applied at the factory along with a label identifying the ANSUL® foam concentrate for use in the tank.

Every tank bears a permanently affixed ASME data plate showing the National Board number which identifies the tank as compliant with ASME code Section VIII, Division 1 for unfired pressure vessels.

ANSUL® 200 gal (757 L) and larger bladder tanks are CE marked in conformance with the European Pressure Equipment Directive, 2014/68/EU. Under European Pressure Equipment Directive 2014/68/EU, tanks smaller than 200 gal are acceptable based on sound engineering practices of ASME code and cannot be CE marked.

ANSUL® Vertical Bladder Tanks up to 800 gal (3,028 L) meet the minimum requirements for Seismic Zone 4 Earthquake Resistant Design as calculated according to the 1997 Uniform Building Code.

Operation and maintenance

Refer to the ANSUL® Horizontal and Vertical Bladder Tank Operation and Maintenance Manual for detailed procedures on installation, operation, inspection, and maintenance. A printed copy of this manual is included with every tank.

Valve position information

Table 1: Valve position information

Valve description		Normal valve position	
Valve No.	Description	Manual system	Automatic system
1	Manual foam concentrate shutoff (not shown)	N.C.**	N.O.***
2	Water supply shut-off (not shown)	N.C.	N.O.
3	Sight gauge shut-off (not shown)	N.C.	N.C.
4	Tank shell vent valve	N.C.	N.C.
5	Bladder vent valve	N.C.	N.C.
6	Tank shell drain valve	N.C.	N.C.
7	Bladder drain/fill valve	N.C.	N.C.
8	Automatic foam concentrate isolation (not shown)	–	N.C.
9	Isolation valve	N.C.	N.C.
* Reference Figure 1 for valve location			
** N.C. – Normally closed			
*** N.O. – Normally open			
In this arrangement, valves listed as (not shown) are either supplied as loose items or supplied by others.			

Ordering information

Specify the following information when ordering:

- Part No. for the required bladder tank size and orientation (see Table 3)
- Foam concentrate type to be used¹
- One option² from each of the following categories:

Table 2: Ordering options

Category	Options
Exterior paint	Option 1: Standard Option 2: CR epoxy
Exterior paint color	Option 1: Red (RAL 3001) Option 2: Blue (RAL 5019) Option 3: Yellow (RAL 1021) Option 4: Other ⁴
Trim piping / valve material	Option 1: Brass piping / brass valves Option 2: 316 stainless steel piping / stainless steel valves
Sight gauge	Option 1: Sight gauge included Option 2: No sight gauge
Thermal relief valve ⁵	Option 1: No thermal relief valve Option 2: Thermal relief valve included
Packaging	Option 1: Domestic packaging Option 2: Export crating

Ordering notes:

1. Tanks are marked as UL Listed and/or FM Approved based on the foam concentrate type specified. If the foam concentrate type is not specified, the tank is not marked as UL Listed or FM Approved.
2. If an option is not specified from a category, Option 1 is used as the default.
3. UL Listing of paint systems is color-specific. The red, blue, and yellow color shade options shown in Table 2 are UL Listed. Contact Johnson Controls Technical Services to determine if other color shades are UL Listed.
4. If you select **other**, the specific paint shade required must be supplied. Availability of the paint shade selected may impact lead time.
5. The set pressure is 175 psi (12.1 bar). The set pressure cannot exceed the design pressure of the tank in accordance with ASME code.

Expediting service

Selected sizes of ANSUL® Vertical Bladder Tanks, including most of the standard options listed above, are available for optional expediting service. These tanks can be shipped in two weeks or less after order confirmation. See the ordering part numbers table for the specific sizes eligible for this service.

Note: Expedited tanks are only available in RAL 3001 Red. Contact Johnson Controls Technical Services or an ANSUL® Regional Sales Manager for additional information and limitations on this service.

Table 3: Ordering part numbers

Nominal capacity	Part No.	Expediting available
gal		
50	444067	√
100	444068	√
150	444069	√
200	444070	
300	444071	√
400	444072	
500	444073	√
600	444074	
700	444075	
800	444076	
900	444077	
1,000	444078	
1,200	444079	
1,400	444080	
1,600	444081	
1,800	444082	
2,000	444083	

Ordering information

Flange adapters

Johnson Controls Figure 71 Flange Adapters are available to adapt the grooved fittings supplied with ANSUL® Vertical Bladder Tanks to flanged piping for field installation. The sizes listed in Table 4 have a maximum pressure rating of 300 psi (20.7 bar). The flange adapter body is ductile iron and utilizes a Grade T Nitrile gasket. The adapter is finished with a non-lead paint.

Table 4: Flange adapters

Adapter size		Recommended flange mating bolts (supplied by others)			Approx. weight	Ordering Part No.
Grooved	ANSI flange	Size Dia x L		Bolt torque range		
in. (mm)	in. (DIN)	in.	Qty.	ft-lb (N-m)	lb (kg)	
2 (50)	2 (DN50)	5/8 x 3	4	110 to 140 (149 to 190)	3.0 (1.4)	7120TS
2 1/2 (65)	2 1/2 (DN65)	5/8 x 3	4	110 to 140 (149 to 190)	5.0 (2.3)	7125TS
3 (80)	3 (DN80)	5/8 x 3	4	110 to 140 (149 to 190)	5.6 (2.5)	7130TS
4 (100)	4 (DN100)	3/4 x 3 1/2	8	220 to 250 (298 to 339)	7.0 (3.2)	7140TS
6 (150)	6 (DN150)	3/4 x 3 1/2	8	220 to 250 (298 to 339)	10.0 (4.5)	7160TS
8 (200)	8 (DN200)	3/4 x 3 1/2	8	220 to 250 (298 to 339)	16.6 (7.5)	7180TS

Touch-up paint

Touch-up paint for red (RAL 3001) equipment is available in a convenient 7 oz spray can. Touch-up paint for other colors is not available in spray cans. Contact Johnson Controls Technical Services for touch-up paint in other colors.

- Red (RAL 3001) touch-up paint: Part No. 405581

Custom engineering

ANSUL® Vertical Bladder Tanks can be customized to accommodate a variety of special requirements, including but not limited to ladders, platforms, alternate materials of construction, higher design pressures, space constraints, larger capacities, and seismic rated tanks.

Contact Johnson Controls Technical Services or an ANSUL® Regional Sales Manager for additional information or to obtain a quote.

Note: UL Listed tanks are limited to maximum capacities of 3,000 gal for vertical tanks with maximum working pressures of 175 psi to 250 psi (12.1 bar to 17.2 bar). FM Approved tanks are limited to maximum capacities of 2,000 gal.

Dimensions

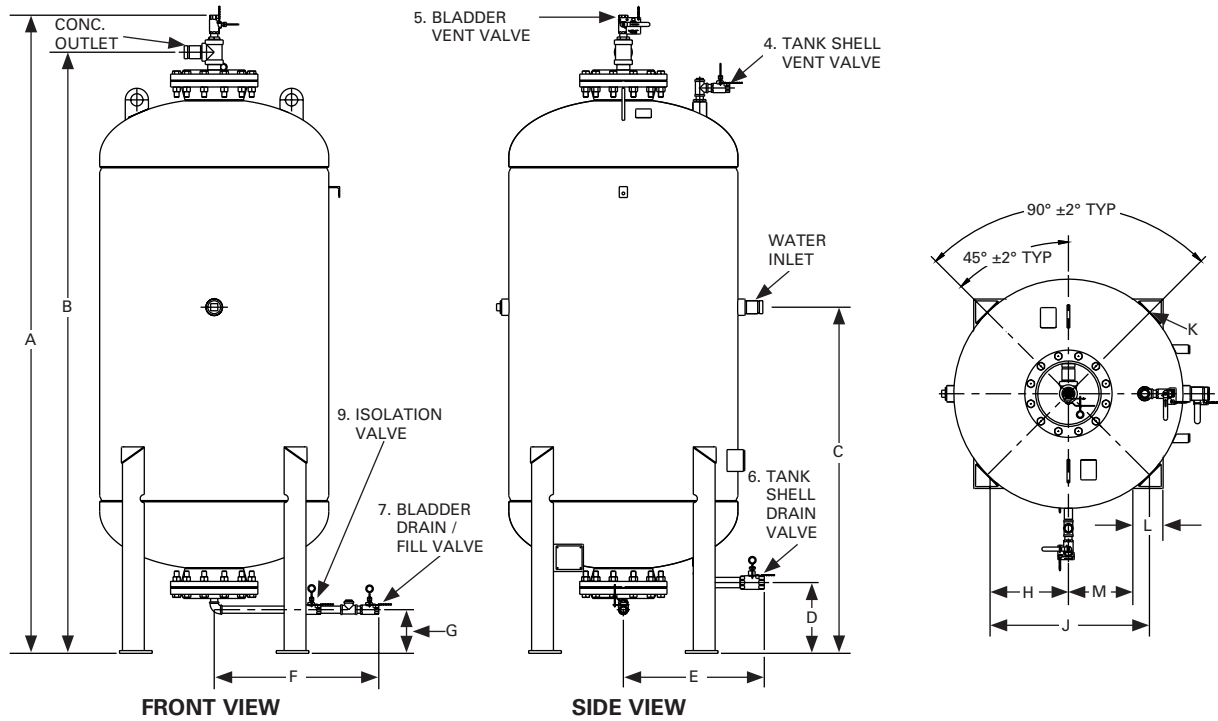


FIGURE 1
010071

Table 5: Dimensions

Part No.	Nominal capacity gal (L)	Dia. in. (mm)	Tank weight (empty) lb (kg)	Water inlet – NPT or grooved in.	Concentrate outlet – NPT or grooved in.	Tank shell vent NPT in.	Bladder vent/fill NPT in.	Bladder drain/fill NPT in.	Tank shell drain NPT in.	A in. (mm)	B in. (mm)	C in. (mm)
444067	50 (189)	24 (610)	459 (208)	2	2	1	1	1	1	65 1/4 (1,657)	58 1/4 (1,480)	38 3/4 (984)
444068	100 (379)	24 (610)	576 (261)	2	2	1	1	1	1	95 1/4 (2,419)	88 1/2 (2,248)	55 3/4 (1,416)
444069	150 (568)	30 (762)	766 (347)	2	2	1	1	1	1 1/2	94 1/4 (2,394)	87 1/2 (2,223)	63 1/2 (1,613)
444070	200 (757)	30 (762)	872 (396)	2	2	1	1	1	1 1/2	113 3/4 (2,889)	107 1/4 (2,724)	63 1/2 (1,613)
444071	300 (1,136)	42 (1,067)	1,409 (639)	2	2	1	1	1	1 1/2	97 (2,464)	90 1/4 (2,292)	63 1/2 (1,613)
444072	400 (1,514)	42 (1,067)	1,648 (748)	2	2	1	1	1	1 1/2	117 (2,972)	110 1/4 (2,800)	63 1/2 (1,613)
444073	500 (1,893)	48 (1,219)	1,939 (880)	3	3	1	1	1	1 1/2	116 (2,946)	108 1/4 (2,750)	63 1/2 (1,613)
444074	600 (2,271)	48 (1,219)	2,146 (973)	3	3	1	1	1	1 1/2	130 (3,302)	123 1/4 (3,131)	63 1/2 (1,613)
444075	700 (2,650)	48 (1,219)	2,351 (1,066)	3	3	1	1	1	1 1/2	145 3/4 (3,702)	138 (3,505)	63 1/2 (1,613)
444076	800 (3,028)	48 (1,219)	2,586 (1,173)	3	3	1	1	1	1 1/2	161 3/4 (4,108)	154 1/4 (3,918)	63 1/2 (1,613)
444077	900 (3,407)	60 (1,524)	2,897 (1,314)	3	3	1	1	1	1 1/2	130 1/4 (3,308)	122 1/2 (3,112)	70 (1,778)
444078	1,000 (3,785)	60 (1,524)	3,097 (1,405)	3	3	1	1	1	1 1/2	140 (3,556)	132 1/4 (3,359)	70 (1,778)
444079	1,200 (4,542)	60 (1,524)	3,392 (1,539)	3	3	1	1	1	1 1/2	154 1/4 (3,918)	146 1/2 (3,721)	70 (1,778)
444080	1,400 (5,300)	60 (1,524)	3,809 (1,728)	3	3	1	1	1	1 1/2	173 1/4 (4,401)	165 1/2 (4,204)	70 (1,778)
444081	1,600 (6,057)	73 (1,854)	4,802 (2,178)	3	3	1	1	1	1 1/2	144 3/4 (3,677)	137 (3,480)	70 (1,778)
444082	1,800 (6,814)	73 (1,854)	5,206 (2,361)	3	3	1	1	1	1 1/2	156 3/4 (3,981)	149 1/4 (3,791)	70 (1,778)
444083	2,000 (7,571)	73 (1,854)	5,828 (2,644)	3	3	1	1	1	1 1/2	175 (4,445)	167 1/2 (4,255)	70 (1,778)

Dimensions

Table 5: Dimensions (Continued)

	Nominal capacity	Dia.	D	E	F	G	H	J	K	L	M
Part No.	gal (L)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)
444067	50 (189)	24 (610)	12 3/4 (234)	15 (381)	21 1/4 (540)	8 1/2 (216)	8 3/8 (213)	16 5/8 (422)	3/4 x 1 1/4 (19 x 32)	3 (76)	6 7/8 (175)
444068	100 (379)	24 (610)	12 3/4 (234)	15 (381)	21 1/4 (540)	8 1/2 (216)	8 3/8 (213)	16 5/8 (422)	3/4 x 1 1/4 (19 x 32)	3 (76)	6 7/8 (175)
444069	150 (568)	30 (762)	11 3/4 (298)	20 1/4 (514)	24 1/4 (616)	8 1/4 (210)	10 5/8 (270)	21 3/16 (538)	3/4 x 1 1/4 (19 x 32)	4 (102)	8 5/8 (219)
444070	200 (757)	30 (762)	11 3/4 (298)	21 (533)	24 1/4 (616)	8 1/4 (210)	10 5/8 (270)	21 3/16 (538)	3/4 x 1 1/4 (19 x 32)	4 (102)	8 5/8 (219)
444071	300 (1,136)	42 (1,067)	13 (330)	25 3/4 (654)	30 1/4 (768)	8 (203)	14 3/8 (365)	28 3/4 (730)	3/4 x 1 1/4 (19 x 32)	6 (152)	11 3/8 (289)
444072	400 (1,514)	42 (1,067)	13 (330)	25 3/4 (654)	30 1/4 (768)	8 (203)	14 3/8 (365)	28 3/4 (730)	3/4 x 1 1/4 (19 x 32)	6 (152)	11 3/8 (289)
444073	500 (1,893)	48 (1,219)	12 1/2 (318)	28 3/4 (730)	33 1/4 (845)	8 (203)	16 9/16 (421)	33 1/16 (840)	1 x 1 1/4 (25 x 32)	6 (152)	13 4/7 (344)
444074	600 (2,271)	48 (1,219)	12 1/2 (318)	28 3/4 (730)	33 1/4 (845)	8 (203)	16 9/16 (421)	33 1/16 (840)	1 x 1 1/4 (25 x 32)	6 (152)	13 4/7 (344)
444075	700 (2,650)	48 (1,219)	12 1/2 (318)	28 3/4 (730)	33 1/4 (845)	8 (203)	16 9/16 (421)	33 1/16 (840)	1 x 1 1/4 (25 x 32)	6 (152)	13 4/7 (344)
444076	800 (3,028)	48 (1,219)	12 1/2 (318)	28 3/4 (730)	33 1/4 (845)	8 (203)	16 9/16 (421)	33 1/16 (840)	1 x 1 1/4 (25 x 32)	6 (152)	13 4/7 (344)
444077	900 (3,407)	60 (1,524)	12 1/4 (311)	34 3/4 (883)	39 1/4 (997)	8 (203)	21 3/16 (538)	42 7/16 (1,078)	1 x 1 1/4 (25 x 32)	6 (152)	18 1/5 (462)
444078	1,000 (3,785)	60 (1,524)	12 1/4 (311)	34 3/4 (883)	39 1/4 (997)	8 (203)	21 3/16 (538)	42 7/16 (1,078)	1 x 1 1/4 (25 x 32)	6 (152)	18 1/5 (462)
444079	1,200 (4,542)	60 (1,524)	12 1/4 (311)	34 3/4 (883)	39 1/4 (997)	8 (203)	21 3/16 (538)	42 7/16 (1,078)	1 x 1 1/4 (25 x 32)	6 (152)	18 1/5 (462)
444080	1,400 (5,300)	60 (1,524)	12 1/4 (311)	34 3/4 (883)	39 1/4 (997)	8 (203)	21 3/16 (538)	42 7/16 (1,078)	1 x 1 1/4 (25 x 32)	6 (152)	18 1/5 (462)
444081	1,600 (6,057)	73 (1,854)	11 1/2 (292)	41 1/4 (1,048)	45 3/4 (1,162)	8 (203)	21 3/16 (538)	51 3/8 (1,305)	1 x 1 1/4 (25 x 32)	6 (152)	22 2/3 (576)
444082	1,800 (6,814)	73 (1,854)	11 1/2 (292)	41 1/4 (1,048)	45 3/4 (1,162)	8 (203)	25 11/16 (652)	51 3/8 (1,305)	1 x 1 1/4 (25 x 32)	6 (152)	22 2/3 (576)
444083	2,000 (7,571)	73 (1,854)	11 1/2 (292)	41 1/4 (1,048)	45 3/4 (1,162)	8 (203)	25 11/16 (652)	51 3/8 (1,305)	1 x 1 1/4 (25 x 32)	6 (152)	22 2/3 (576)

Dimension and installation notes:

- Dimensions listed are approximate and subject to change without notice.
- Foam concentrate discharge pipe
 - Tank sizes 50 gal to 400 gal (189 L to 1,514 L):
2 in. female NPT or grooved
 - Tank sizes 500 gal to 2,000 gal (1,893 L to 7,571 L):
3 in. female NPT or grooved
- Water inlet pipe
 - Tank sizes 50 gal to 400 gal (189 L to 1,514 L):
2 in. female NPT or grooved
 - Tank sizes 500 gal to 2,000 gal (1,893 L to 7,571 L):
3 in. female NPT or grooved
- Rooms or buildings intended to house a bladder tank should have accommodations for the removal of the internal center tube. Center tubes are approximately the full height of the bladder tank.

Note: While NFF (also known as SFFF) agents may be compatible with existing AFFF and/or NFF hardware, system contamination from fluorinated agents may exist if hardware and piping is not replaced upon conversion to non-fluorinated agents.

Note: The converted values provided in this document are for nominal reference only and do not reflect an actual measurement.

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