Neutralizing Tanks



Features:

- Lightweight PE Resin; Natural Off-White Colour
- Broad Size Range, Customized Connections (both size and location)
- Inlet/Outlet/Vent

- Chemically Resistant; Low Maintenance
- In-Ground & Above-Ground Gasketted & Bolted Covers
- Wide Range of Monitoring Accessories

Neutralization Tanks are designed to receive, dilute and neutralize corrosive and harmful chemical wastes, before allowing such materials to be discharged in accordance with local environmental requirements.

Standard Tanks are produced from top quality natural (off-white) Linear Low Density Polyethylene (LLDPE) resins. They are seamless, have uniform wall thickness and are free of stresses. All connections are welded into the tank wall or cover, both size and location are customized to the customer requirement. Details of standard tanks and common options are shown in our Price List. A completed tank drawing should be included with every order.

pHpro[™] Tank System Features

Monitoring tank systems feature custom combinations of the following:

- Cylindrical T5- (bolted and gasketted moulded lid), or T6- (bolted and gasketted 1" thick flat plastic sheet lid with 1/8" thick scoriated aluminum cover) style tanks.
- Standard roto-moulded sizes range from 5 1000 Imperial gallons /6 1200 US gallons.
- Inlets, outlets, vents, waterfeeds, inspection ports, etc., in locations and numbers required as specified by the engineer.
- Sediment interceptors, buffer tanks, neutralization tanks (using chips or acid/alkali injectors), sampling tanks.
- pH monitors, audible/visual alarms, chart recorders, injector pumps, mixers.

Technical assistance is available from **pHpro** to help design the acid/alkali neutralization system for your application!



Sizing a Neutralization Tank

Correct sizing of a neutralizing tank must take into account the following:

- Will the flow rate be continuous or intermittent; i.e., dump loads?
- If continuous, what will the average hourly flow rate be (gph)?
- If intermittent, what will the maximum flow rate be (gph)?

Neutralization of pH does not occur instantly – the corrosive waste must remain in the tank long enough for the neutralization process to take place. One hour retention time is the established industry standard; the tank must therefore have an effective capacity equal to or greater than the gallon per hour flow rate. Effective capacity is the tank's capacity to accept liquid after it has been filled with limestone chip neutralizing agent. The rule of thumb for **pHpro** tanks is Effective Capacity = 1/3 Empty Capacity.

Example #1

Flow rate calculated to be 14 gallons per hour. 14 gallon effective size X 3 = 42 gallon empty size. Round up to closest **pHpro** model = 45 gallon tank.

If the flow rate cannot be determined, an arbitrary minimum rate of one gallon per hour per fixture is often used, especially in school labs. For industrial labs this flow rate should be doubled. Photo lab tanks must be sized using actual flow rates, as they are typically much greater than for other applications.

Example #2

Industrial lab with 23 sinks, in continuous use. 23 sinks X 2 gallons per hour = 46 gallons per hour flow rate. 46 gallon effective size X 3 = 138 gallon empty size. Round up to closest **pHpro** model = 150 gallon tank.

While dilution tanks have for the most part been supplanted by neutralizers, there are still some non-pH applications where dilution is the preferred method to render certain chemicals harmless. To correctly size a dilution tank, the manufacturer of the chemicals or products in question should be consulted to determine the safe concentration threshold. Correct sizing will depend on:

- Safe concentration threshold
- Maximum hourly flow
- Concentration of chemical being used

If a mixture of chemicals is being used, the "lowest common denominator" rule applies: the chemical requiring most dilution in the mix will determine the size of the tank.

Example #3

Chemical "X" is being used in 6% solution. Maximum flow rate is 1.3 gph. Safe concentration level is recommended at 0.4%.

.06 solution \times 1.3 gph = 0.078 gph pure chemical 0.078 gph = 0.004 safe concentration level 0.078 gph / 0.004 = 19.5 total gph required

To dilute to the safe concentration level, the tank will need to have a 19.5 gallon minimum capacity; closest **pHpro** tank is 20 gallon.



Tank Size and Chip Chart

Tank Size (IMP. GAL.) Empty	Tank Size (U.S. GAL.) Empty	Tank Inside Dimensions DIA. x HT. in inches	Tank Size (IMP. GAL.) Effective	Tank Size (U.S. GAL.) Effective	Req'd # of 40 Lb Bags Limestone Chips For Acid Neutralization	Chip Wt (LBS)	Chip Wt (KG)	
Cylindrical Tanks								
5	6	11 x 15	2	2	2	79	36	
12	15	13 x 27	4	5	3	119	54	
15A	19	16 x 24	5	6	4	159	72	
1 <i>5</i> B	19	17 x 18	5	6	4	159	72	
20	25	17 x 24	6	8	5	198	90	
25A	30	16 x 34	8	10	6	238	108	
25B	30	17 x 30	8	10	6	238	108	
30A	38	18 x 33	10	13	7	277	126	
30B	38	22 x 22	10	13	7	277	126	
45	55	22 x 33	15	18	10	396	180	
50	60	22 x 37	16	20	12	475	216	
60	75	22 x 45	20	25	14	555	252	
75	90	26 x 42	25	30	17	673	306	
100	125	30 x 40	33	42	23	911	414	
125A	155	30 x 50	42	52	28	1109	504	
125B	155	36 x 35	42	52	28	1109	504	
150	185	36 x 42	50	62	34	1347	612	
175	215	36 x 48	58	72	39	1545	702	
200	250	36 x 56	65	83	45	1782	810	
250	310	42 x 52	80	103	56	2218	1008	
300	375	48 x 49	100	125	67	2653	1206	
400	500	48 x 64	130	167	89	3525	1602	
500A	625	48 x 84	165	208	111	4396	1998	
500B	625	60 x 51	165	208	111	4396	1998	
600	750	60 x 60	200	250	133	5267	2394	
750	935	72 x 54	250	312	167	6613	3006	
1000	1250	72 x 72	350	417	222	8791	3996	
Rectangular Tanks								
6	8	12 x 12 x 12	2	3	2	79	36	
14	18	18 x 12 x 18	5	6	4	159	72	
28	35	18 x 18 x 24	9	12	7	277	126	
62	78	30 x 24 x 25	20	26	14	555	252	
78	98	30 x 30 x 24	26	33	18	713	323	
97	121	30 x 30 x 30	32	40	22	871	395	
140	175	36 x 30 x 36	47	58	27	1069	485	

Note: Due to the large number of variables involved with dilution and neutralizing system waste streams, such as chemical makeup, concentration, temperature and flow rate fluctuations, **pHpro** cannot guarantee, implicitly or explicitly, the performance of its neutralization systems.



Sediment Interceptor Size Chart

Interceptor Tank Dimensions

Interceptor Basket Dimensions

Empty Tank Size		DIA. x HT.	Basket Size		DIA. x HT.	
(IMP. GAL)	(U.S. GAL)	in inches	(IMP. GAL)	(U.S. GAL)	in inches	
5	6	11 x 15	2	2.5	8 x 14	
12	15	13 x 27	7	9	10 x 25	
1 <i>5</i> B	19	17 x 18	9	11	13 x 16	
25B	30	17 x 30	14	18	13 x 28	
45	55	22 x 33	28	35	18 x 31	
60	75	22 x 45	39	49	18 x 43	
100	125	30 x 40	67	84	26 x 38	

Tank Installation and Maintenance

Basic installation rules include the following:

- Give solid support to the tank bottom, either a concrete pad, flat platform or compacted stone-free sand.
- Do not support the tank by its fittings or associated piping.
- Do not attempt to install T5 tanks flush with floor: T5 lids are not suitable for load-bearing. T5 tanks may only be installed on the floor or in a covered pit.
- When connecting piping (especially if metal) to FIPT threaded tank fittings, do not overtighten this
 may damage either fittings or welds and result in leaks.
- Once installed, fill the tank with neutralization chips, then water.
- If the tank system includes a pH monitor and probe, do not install the probe until the tank has been filled with water the probe tip needs to be kept wet.

Proper tank functioning requires the following maintenance:

- Tanks and sediment interceptors should be inspected once a month for the first six months. Once the rate of consumption of stone chips in neutralizers, and the basket fill rate for interceptors is established, the schedule may be varied to suit the particular application.
- As the acidic waste is neutralized by the stone chips, the chips will be consumed and shrink in size. This will result in compaction and a lowering of the chip level in the tank. This level should be maintained to the outlet invert, with chips ranging in size from one to three inches in diameter.
- Depending on the rate of chip consumption, the tank should be emptied periodically, and refilled with a fresh charge of chips. Failure to do this will eventually result in a buildup of sand on the tank bottom, which will obstruct the inlet dip tube.
- When checking the tank, look for and remove sludge, scum and any other debris; if the chips are coated, or the connecting pipe is becoming plugged, the efficiency of the tank will be impaired. Continuous depositing of debris in the tank may be an indication that a sediment interceptor should be installed upstream of the neutralizer.



Tank Installation and Maintenance (cont.)

- When inspecting neutralizers and interceptors, ensure that the gasket material is in good shape.
 Should it be torn, abraded, or otherwise damaged, noxious fumes may escape the tank.
 Depending on the tank contents, these fumes may range from merely irritating to posing a health concern.
- Ensure that the lid is securely fastened to the tank, but do not overtighten the wingnuts on floor mounted tanks. Overtightening can deform the tank lid, leading to gaps from which fumes may escape.
- When replacing sediment interceptor baskets, ensure that the tank inlet pipe extends into the
 basket and is secured. If the basket mesh is severely clogged, the basket should be hosed down
 before replacement.
- If the tank is large enough to require maintenance personnel to climb inside the unit for servicing, a two-man buddy system is recommended, along with the appropriate safety gear. Special attention must be paid to ensure that personnel are not overcome by fumes when working inside a tank.
- Flushing the system with water an hour prior to tank servicing is recommended to reduce possible fume and effluent contact hazard.

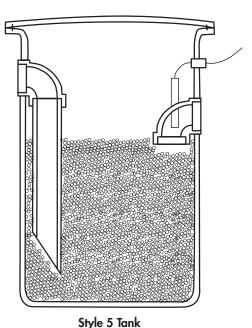
NOTE: When working with a neutralizing tank or sediment interceptor, appropriate safety equipment should be worn. Always wear eye protection. Acid-resistant gloves, coveralls, headgear and footwear, as well as respiratory protection, should be used as required by statute and common sense. Type and extent of safety equipment requirements will be dependent on the individual situation. **Watts Industries (Canada) Inc.** accepts no liability for injury or damages associated with the materials contained within our equipment. Always consult the appropriate Material Safety Data Sheets before working with chemicals.



pH Monitoring/Alarm & Acid Neutralization Systems

Description:

The pHproTM system of acid neutralization with pH monitor is a very effective means of ensuring that acid wastes are not discharged into the sanitary waste system. The system is comprised of an acid neutralization tank, and a monitor to measure the pH of the effluent at the discharge end of the tank. A submersible probe is connected to the control panel with a coaxial cable. Standard cable length is 15 feet.





Digital Meter / Control Panel (Model 540 with Liquid Crystal Display)

Standard tanks are Style T5, T6 or T7 (bolted and gasketted lid), customized for inlet/outlet/option, sizes and locations. Neutralizing chips are shown for clarity, but are not included in the price unless specifically stated otherwise. Tank volumes are often specified as effective volume, as a considerable amount of the total volume is taken by the chips and the free space.

If there is a likelihood that solids can enter the system, it is strongly recommended that a Sediment Interceptor (SI) be added upstream of the pH neutralization tank. Proper inspection and maintenance will help prevent potentially costly blockages and waste backup.

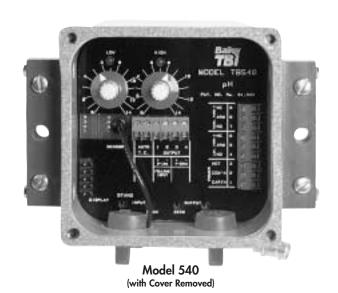
pH Monitoring/Alarm & Acid Neutralization Systems

General Description:

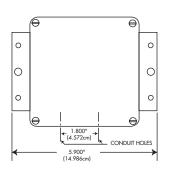
The system is comprised of the following elements: a pH neutralization tank, a submersible probe placed in the outlet flange of the tank, and a monitor/control panel connected by coaxial cable to the tank assembly. The monitoring unit is encased in a NEMA 4X PVC enclosure, approx. 4" X 4", and the front faceplate is of clear lexan. A liquid crystal display will give a continuous read out of pH levels from the probe, with 0.01pH resolution. The unit is standard with contacts for an adjustable high/low alarm, and 4 – 20 mA output for recording, control or safety interlock purposes.

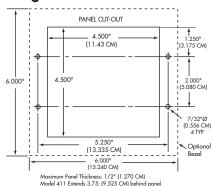
Model 540 Specifications:

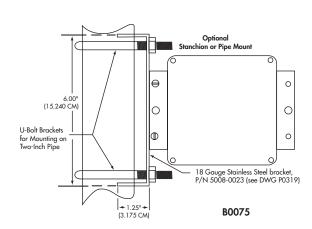
Model	540 - pH				
Range	0-14 pH				
Resolution	0.01 pH				
Set Point Accuracy	±2%				
Resolution	1% of span				
Hysteresis	1% of span				
Contact Rating	SPDT (1 High, 1 Low)				
· ·	115 VAC, 2.5A				
	Inductive Load				
Digital Display	0-14.00 pH				
Recorder Output	4-20 mA				
'	500 ohm max. load				
	0-5 VDC				
	1 mA available				
Minimum Span	4 pH				
Accuracy	±0.5% fs				
Power	115/220 VAC, 50-60Hz				



Dimensions & Panel Mounting Detail:







The system can be supplied with or without an initial supply of neutralization chips. **Note:** The chips are consumed by the neutralization process and must be periodically replenished. As well, the operation of the pH probe is very similar to that of a wet cell battery, as such, probes **do require periodic replacement.** It is crucial that a maintenance program be established and adhered to ensure the safe, effective operation of the system.

A wide variety of customised options and variations are available. Such things as heavy duty (pedestrian area) tank lids, inspection ports, special sizes, custom outlets and inlets, as well as expertise in specifying and designing a system are available. We will be pleased to review your specific needs.

Note: A completed tank drawing showing locations and sizes of inlets & outlets should be provided with every neutralization tank order or request for quotation.

Tank System Specification Sheet

Specifying a basic **pHpro**TM tank may be done in three easy steps, resulting in the appropriate part number for ordering the product.

- 1. Specify tank style as follows:
 - T5- Cylindrical Tank On-Floor Only Light Duty Moulded Lid Bolted & Gasketted
 - **T6-** Cylindrical Tank On-Floor *or* Flush With Floor 1" Thick Plastic Lid, with 1/8" Thick Scoriated Aluminum Cover Bolted & Gasketted
 - 17- Rectangular Tank On-Floor Only Light Duty Moulded Lid Bolted & Gasketted
 - **T8-** Rectangular Tank Undercounter Light Duty Integral (Moulded-On) Lid
- 2. Specify inlet/outlet size as follows:

Fittings are available in FIPT or plain pipe. They may be located anywhere on the tank, using the appropriate tank drawing. Multiple inlets, outlets, vents and waterfeeds may be specified. Standard tanks as described in our price list include one inlet, outlet and vent only. T6- style tanks up to 22" diameter do not include an access port; T6- tanks 22" and greater in diameter include a standard 10" diameter access port. Access ports are not available for T5 moulded tank lids; 4" diameter cleanout-style inspection ports may be specified for T5 tanks.

3. Specify tank size using **Tank Size & Chip Chart**: use "Imperial/U.S. Gallon (Empty)" size column. For extra clarity, we recommend including the tank dimensions: diameter X height for T5- and T6-tanks; length X width X height for T7- tanks. T8- tanks are available in 2-gallon and 6-gallon capacities only. All tanks in price lists are in Imperial gallons. Completing all three steps will result in a part number.



pHpro[™] Tank Sample Specifications:

T5 Tanks: On-Floor Installations Only

Tank shall be **pHpro** T5-style [insert part number] seamless, LLDPE, rotationally moulded, cylindrical tank, with light duty moulded lid, gasketted and bolted to tank. All tank connections shall be FIPT or plain pipe, and shall be heat fused to tank, and shall be located as shown on tank drawing. Completed drawing must be submitted to **Watts pHpro** prior to manufacture.

To Tanks: On-Floor or Flush-with-Floor Installations

Tank shall be **pHpro** T6-style [*insert part number*] seamless, LLDPE, rotationally moulded, cylindrical tank, with 1" thick plastic lid with 1/8" thick scoriated aluminum cover, gasketted and bolted to tank. All bolts shall be countersunk. All tank connections shall be FIPT or plain pipe, and shall be heat fused to tank, and shall be located as shown on tank drawing. Completed drawing must be submitted to **Watts pHpro** prior to manufacture.

For tanks 22" in diameter and greater <u>only</u>: tank lid shall include a 10" diameter inspection port, gasketted and secured to lid with screws.



Sample Specifications: (cont.)

T7 Tanks: On-Floor Installations Only

Tank shall be **pHpro** T7-style [insert part number] seamless, LLDPE, rotationally moulded, rectangular tank, with light duty moulded lid, gasketted and bolted to tank. All tank connections shall be FIPT or plain pipe and shall be heat fused to tank, and shall be located as shown on tank drawing. Completed drawing must be submitted to **Watts pHpro** prior to manufacture.

T8 Tanks: On-Floor / Undercounter Installations Only

Tank shall be **pHpro** T8-style [*insert part number*] seamless, LLDPE, rotationally moulded, rectangular tank, with light duty integral lid. All tank connections shall be FIPT or plain pipe, and shall be heat fused or integral to tank, and shall be located as shown on tank drawing. Completed drawing must be submitted to **Watts pHpro** prior to manufacture.

Options for all Tanks:

Tank shall come equipped with optional probe holder outlet, or additional inlet(s) / outlet(s), or sight glass, or waterfeed, or level switch.

pHpro™ Sediment Interceptor Sample Specifications:

SI5 Sediment Interceptors: On-Floor Installations Only

Sediment interceptor shall be **pHpro** SI5-style [insert part number] seamless, LLDPE, rotationally moulded, cylindrical tank, with light duty moulded lid, gasketted and bolted to tank; basket shall be fabricated from 1/8" thick perforated PE sheet. Perforations shall be 1/8" diameter maximum. All sediment interceptor connections shall be FIPT or plain pipe, and shall be heat fused to interceptor, and shall be located as shown on interceptor drawing. Completed drawing must be submitted to **Watts pHpro** prior to manufacture.

SI6 Sediment Interceptors: On-Floor or Flush-with-Floor Installations

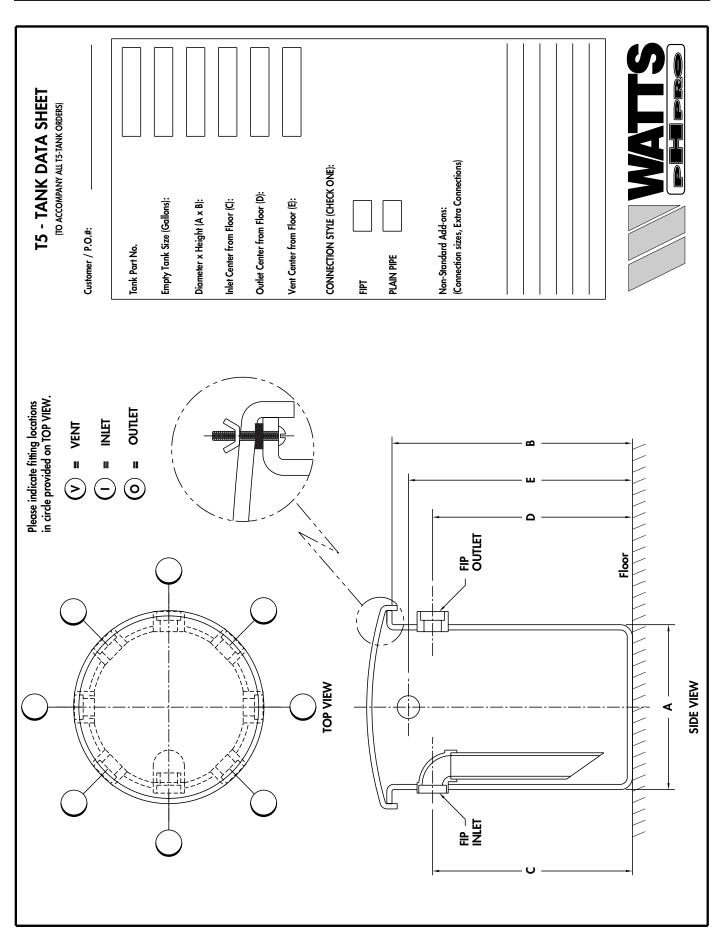
Sediment interceptor shall be **pHpro** SI6-style [insert part number] seamless, LLDPE, rotationally moulded, cylindrical tank, with 1" thick plastic lid with 1/8" thick scoriated aluminum cover, gasketted and bolted to tank; basket shall be fabricated from 1/8" thick perforated PE sheet. Perforations shall be 1/8" diameter maximum. All bolts shall be countersunk. All sediment interceptor connections shall be FIPT or plain pipe, and shall be heat fused to interceptor, and shall be located as shown on interceptor drawing. Completed drawing must be submitted to **Watts pHpro** prior to manufacture.

For SI6 sediment interceptors 22" in diameter and greater <u>only</u>: interceptor lid shall include a 10" diameter inspection port, gasketted and secured to lid with screws.

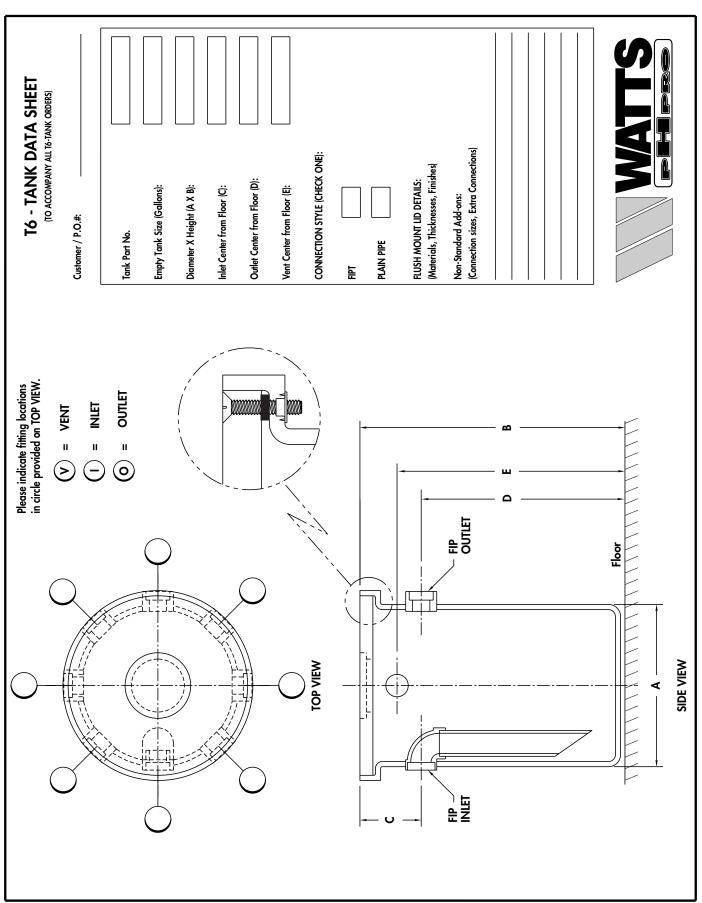
pHpro™ pH Monitor / Sensor Sample Specification

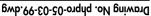
pH monitor shall be **pHpro** model TB540TRANS, with NEMA 4 enclosure, 4-20 mA non-isolated output, dual HI/LO alarm contacts, LCD display with 0-14 pH range, 0.01 pH resolution, +/- 2% set point accuracy. Sensor shall be **pHpro** model TB551311SENS, with submersible ryton body, high temperature glass electrode, integral thermocompensator, 15 feet integral sensor cable.



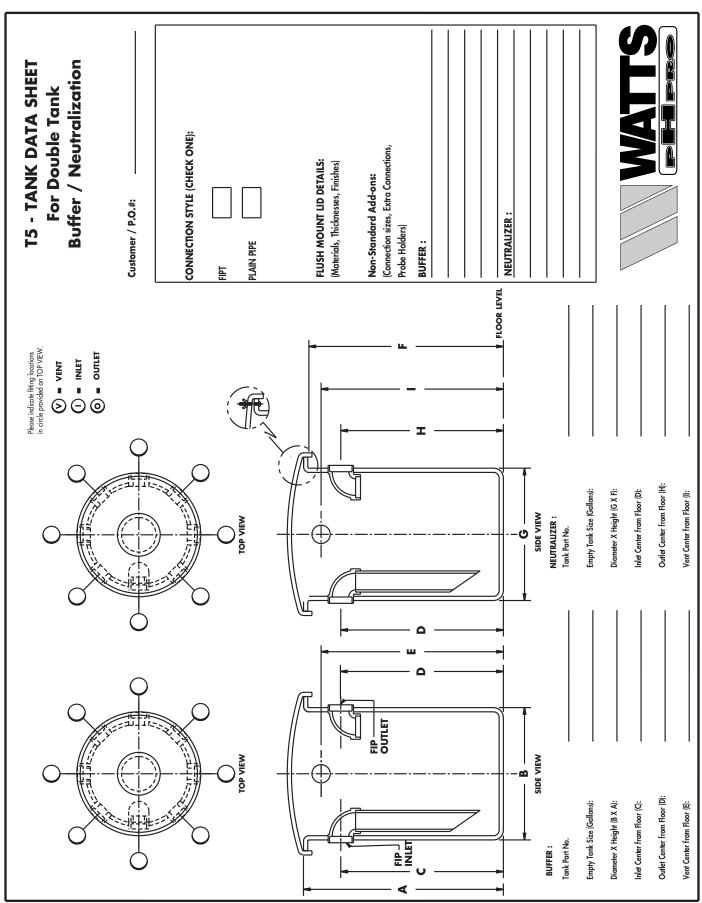


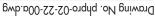




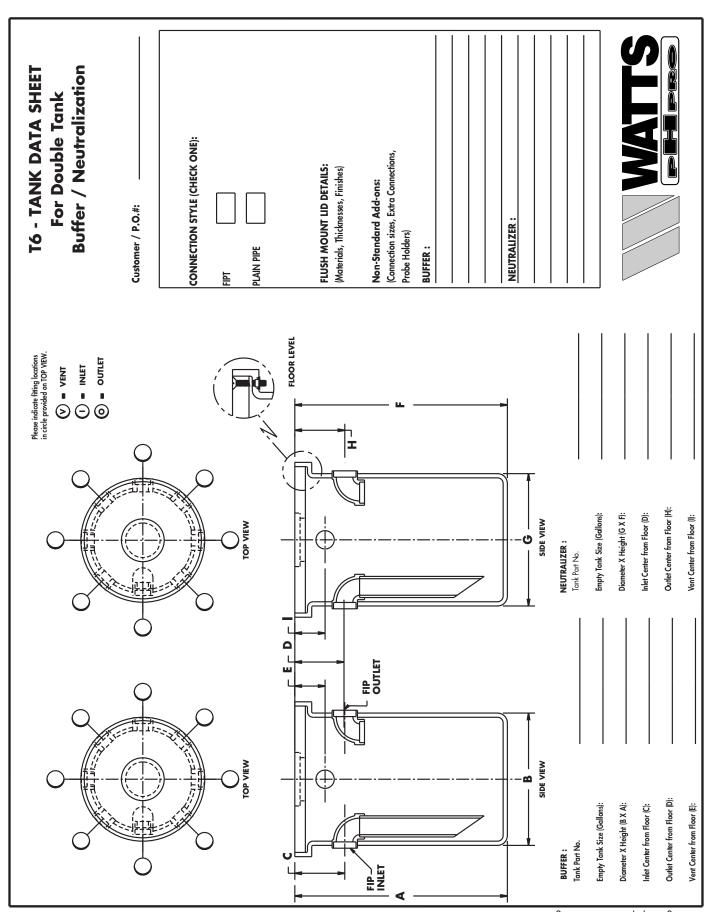


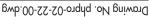




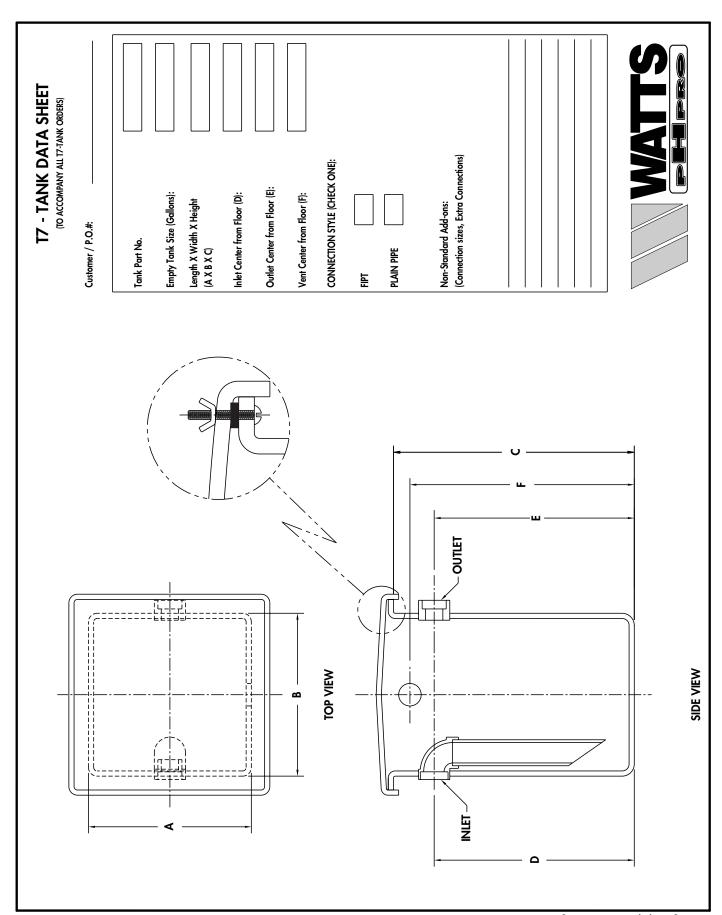






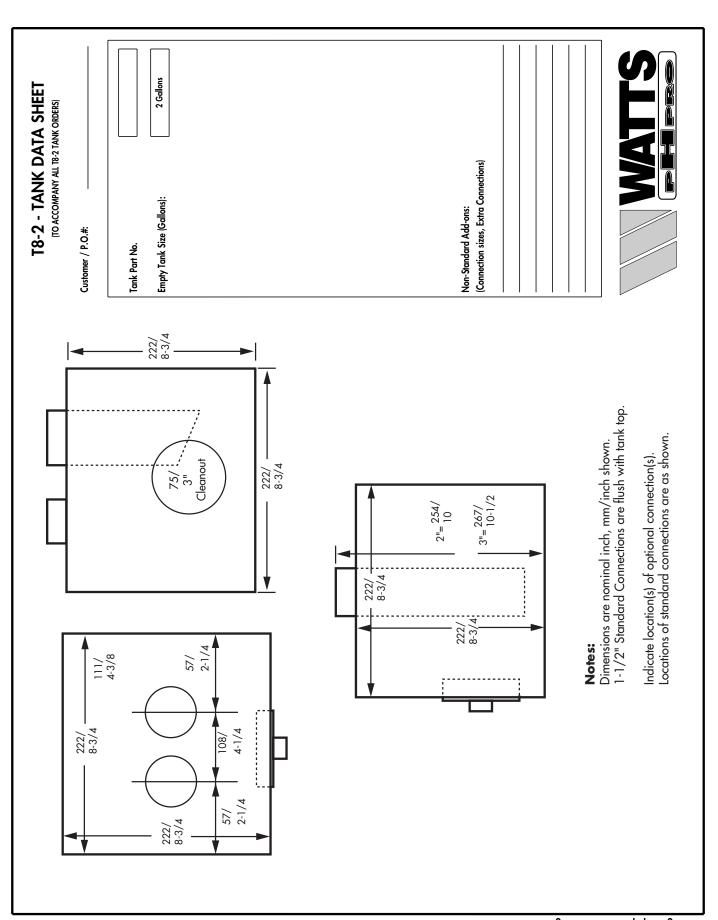




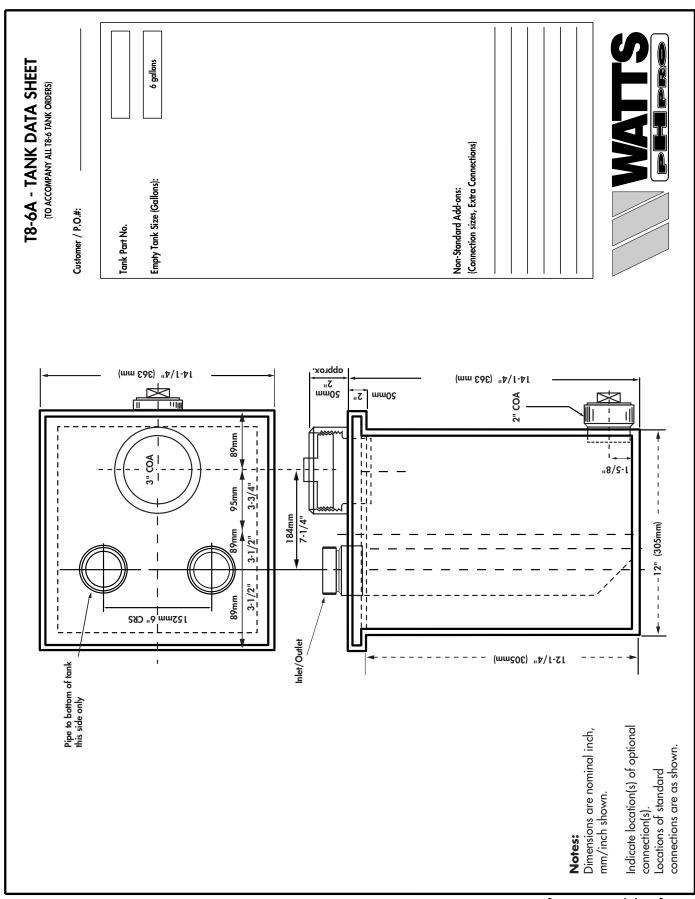


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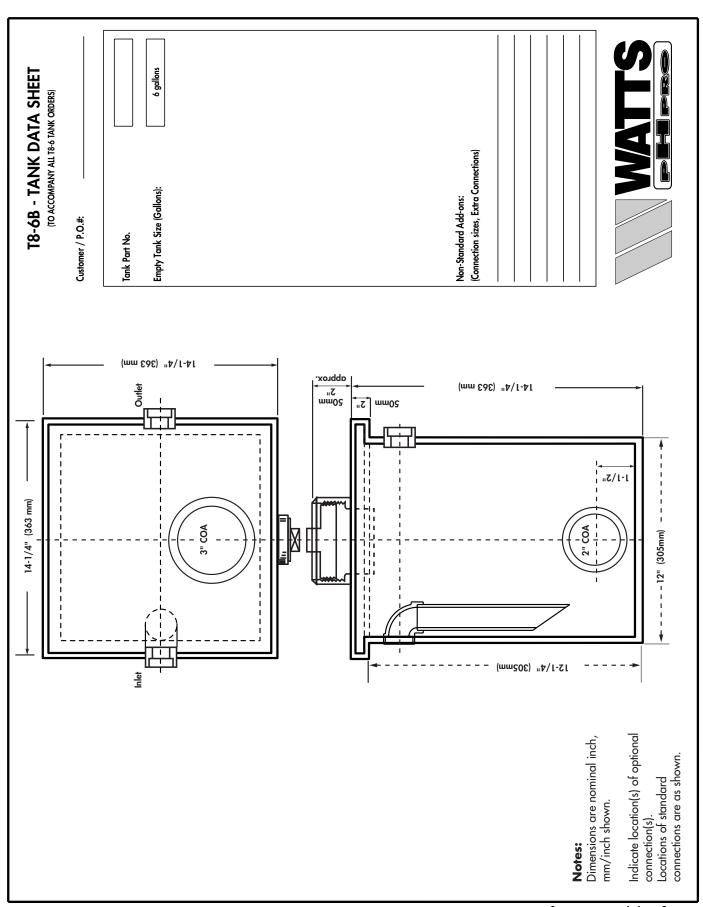




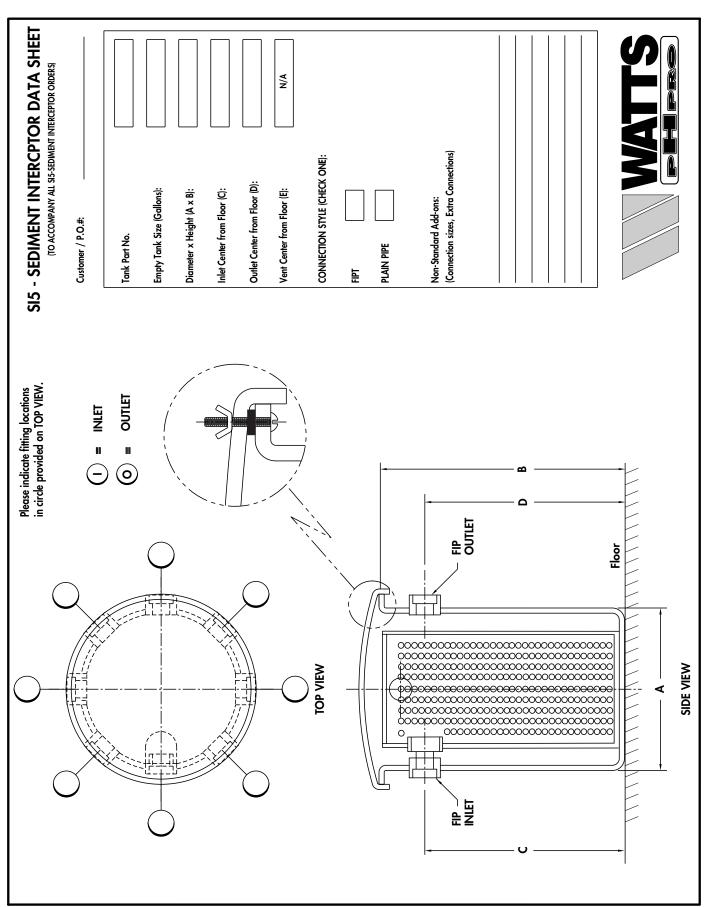






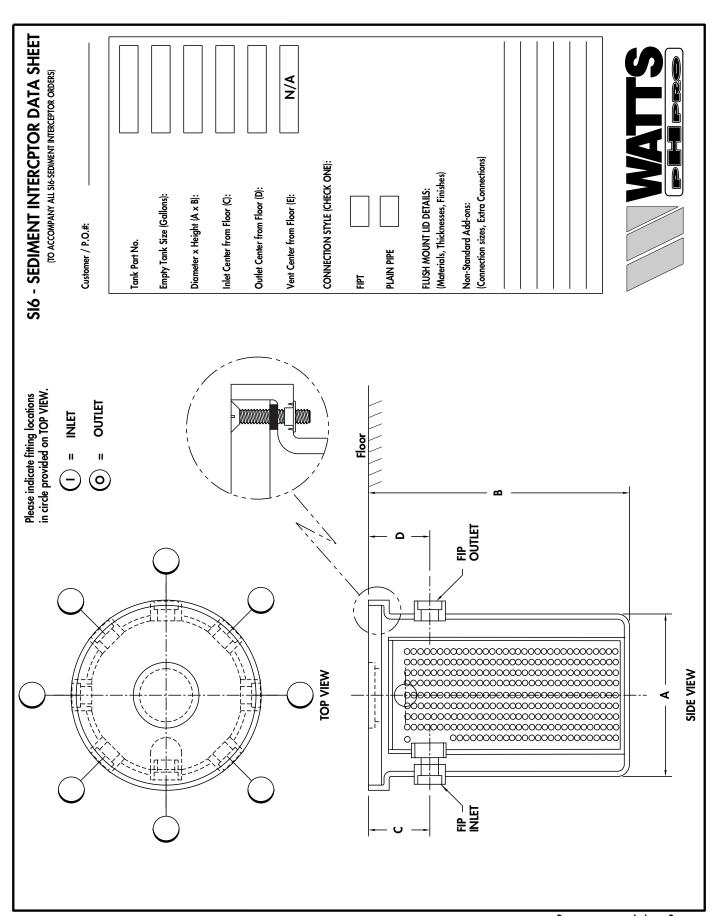






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pHpro Standard Tank Fitting Locations

NOTE: For T5 and T7 Tanks, all dimensions are from underside top flange to centerline. For T6 Tanks, all dimensions are from floor level to centerline.

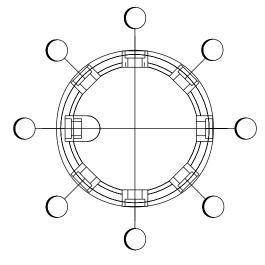
All dimensions are in inches.

T5 and **T7** Standard Connection Locations

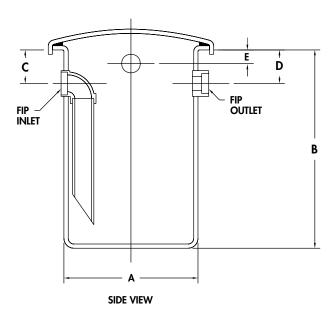
CONNECTION SIZE	(C) INLET	(D) OUTLET	(E) VENT	VENT SIZE
1.5	4	5	3	1.5
2	4	5	3	2
3	5	6	4	2
4	6	7	5	3

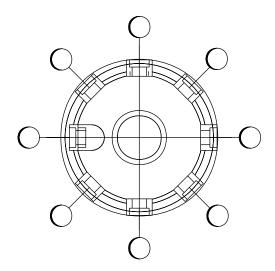
T6 Standard Connection Locations

CONNECTION SIZE	(C) INLET	(D) OUTLET	(E) VENT	VENT SIZE
1.5	5	6	4	1.5
2	5	6	4	2
3	6	7	5	2
4	7	8	6	3



TOP VIEW





TOP VIEW

