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OWNER'S MANUAL



Class 1

T-500

T-600

T-750

T-1000

T-1500

T-558

Rev. Date 15 April 2013

INTRODUCTION To Your New On-Site Wastewater Sewage Facility

The purpose of your aerobic treatment plant is to provide your family and the environment with an effective, reliable and efficient treatment of the domestic wastewater from your home or business.

Aerobic bacteria live in nature (streams, rivers, lakes etc.) consuming feces from aquatic life, people and other decaying organic matter, keeping the worlds water clean. A similar process is what's taking place inside the TuffTiger system. Mother Nature, created these tiny bugs and where giving them the perfect environment to perform at an accelerated rate.

Approximately one third of the United State total population use some form of on-site sewage facility and this number continues to increase rapidly. Most people don't want to know about or deal with what happens to domestic wastewater from individual homes and businesses (out of site out of mind). With the ever shrinking supply of water for use and consumption the importance of treating and recycling the world's wastewater is becoming ever more important. That is why it is very important you read this owner's manual in its entirety and follow all instructions.

Today an aerobic treatment plant is in the back yards of many homes and business outside the reach of municipal wastewater treatment systems. With several environmentally safe ways to recycle and dispose of the effluent by surface spray, subsurface drip emitter and conventional drain field. The responsible of protecting human health and the environment is becoming more and more the responsibility of the property owner to provide treatment to the domestic wastewater prior to its release back into the environment. Treated domestic wastewater is a valuable commodity that has not received the attention it deserves but with your purchase of the TuffTiger System you have made the first step in a vital contribution in protecting your family's health and the future of our environment.

Your TuffTiger System is one of the finest designed systems on the market and will last for many years without failure, if services regularly by a trained Authorized Dealer's service personnel to maintain proper operation and a high degree of treatment to the wastewater.

Process Description

The TuffTiger System On-Site sewage facility is an extended activated sludge plant in miniature that uses a small remote air compressor and a single tank with two compartments to achieve a high degree of treatment.

Wastewater enters through a 4" inlet pipe into the outer aeration chamber and is mixed with air brought in by an aerator. Four critically spaced air lines with a small orifice in each line are located at the unions to achieve equal distribution to each diffuser located near the bottom outer perimeter of the aeration chamber. The diffuser creates thousands of tiny bubbles that supply oxygen for the activated sludge process. As these bubbles are rising a transfer of oxygen to the wastewater is accomplished and the activated sludge stays in suspension.

This allows microorganisms to remove soluble contaminated from the wastewater utilizing them as a source of energy for growth and production of new microorganisms. The organisms tend to form clumps that physically entrap particulate organic matter. The organic matter is attached by millions of enzymes that solubilize (easily dissolve) the solids to make the organic matter consumable for millions of aerobic microorganisms which ultimately convert the wastewater to a clear, odorless liquid.

The conversation of the organic matter from soluble to biological solids (secondary sludge) allows for removal of the organic matter by settling of the solids in the inner cone-shaped clarifier where conditions are calm. Each time wastewater enters the plant the mixed liquor is forced upward through the hole at the bottom of the clarifier. Shortly after the solids settle and re-enter the aeration chamber through the same hole at the bottom of the clarifier for further treatment. The clear water in the mid to upper zone of the clarifier is discharged into the 4" inch pipe as it flows up through the 4" inch tee into the final outlet pipe.

TuffTiger Model T500 is a 860 gallon capacity plant capable of holding a large volume of activated sludge therefore providing you with a long duration between plumping of sludge. The T-500 was tested (and listed) to the ANSI/NSF Standard 40-2000 testing protocol and designated a Class 1 residential wastewater treatment system.

With proper use and prevention maintenance, the TuffTiger System will be an economical asset and an environmentally friendly wastewater treatment system for many years.

START UP PROCEDURES

Initial Start up

- 1. Please read all instructions in this owner's manual prior to use of your TuffTiger System. Please call your dealer for specific information concerning your complete on-site wastewater system. Should you have any questions please call, fax, and e-mail or write TuffTiger.
- 2. Before using any plumbing (toilet, dishwasher, faucets etc....) you should locate the electrical breaker in the main breaker box that provides power to the TuffTiger System control panel. More it in to the on position if it is off. A gravity flow model control panel has an on/off switch on the left side; it must be in the on position. With a pressure flow panel, if the system does not come when the main breaker is turned on DO NOT open the TuffTiger System control panel. Electrical shock hazard which could result in serious injury or death, call you dealer to inspect panel.
- 3. The air compressor is designed to operate continuously. Please make a visual inspection to insure that the air compressor is operating this is done by inspecting control panel for air compressor fail light and horn. Compressor is not running with the light is illuminated.
- 4. The treatment plant should be filled with tap water prior to use. Your dealer ordinarily performs this task during installation. When the power is turned on initially you may get a high water level alarm consisting of a light and horn. To silence this alarm simply trip the silence switch at the control panel, the light will remain on until the water returns to a normal level.
- 5. Your on-site sewage facility has a particular type of disposal field depending on your local and state code. As the operator of your system you should know somewhat of how this part of your on-site wastewater system will do its job. There are four basic methods of disposal of the final effluent, which will be briefly explained as follows:
 - a. Overland discharge, a pipe laying on the surface with holes drilled in a pattern to allow the clear odorless liquid to be disposed of. The overland discharge system is gravity flow.
 - b. Surface spray application, a small number of sprinkler heads located on the property. Depending on your specific system it may spray on demand (each time you run water) or only during late night if a timer is used. The surface spray system is controlled by used of a pump and float switch.
 - c. Subsurface drain field, a perforated PVC pipe 4 inch diameter, perforated 8 inch sock pipe or some other form of leaching chamber. The subsurface drain field is gravity flow.
 - d. Subsurface drip emitter, several hundred feet of small diameter pipe with small orifices to equally distribute the effluent it is under low pressure on a demand basis. The subsurface drip emitter system is controlled by use of a pump and float switch.
 - e. To insure proper disinfection please contact your dealer to inspect the chlorination devise for chlorine tablets and or purchase of chlorine tablets.

 WARNING: Chlorine is very corrosive to moist tissue and has a very irritating effect on the lungs and mucous membranes of the nose and throat. Inhalation of chlorine gas can cause edema (swelling) of the lungs and respiratory stoppage.

YOUR TUFFTIGER SYSTEM SHOULD NOW BE IN OPERATION

RE-START UP PROCEDURES

Causes of Anaerobic Conditions

When the TuffTiger System is shut down for an extended period of three weeks or more the aerobic system will turn anaerobic (become septic). Typical causes of anaerobic conditions are homeowners moving, foreclosures, beach cabins left until next summer etc.....

Other causes are airline leaks from settling of the soil around the tanks that can shift and cause breakage of PVC fittings and pipes that are external and internal of the plant. Accidents from children playing and lawn equipment bumping the air airline at the compressor are reasons for an aerobic system to become septic.

The usual scenario is the installer gets a call after the fact that the system has failed and the owner is experiencing odor problems from the spray field or the ground around the system.

Public Health Threat

All aerobic systems re-started after an anaerobic (septic) condition has persisted for an extended period are potentially a public health threat. That threat is from possible water born diseases being spray irrigated onto lawns and the possibility of human contact and environmental pollution, therefore the trash tank, treatment plant and pump tank should be pumped out by a licensed liquid waste hauling company (pumper).

Maintenance Company Qualification

A state septic system installer license, maintenance provider license or wastewater treatment plant operator license must be held by at least one person in the maintenance company, and certified by TuffTiger as an authorized service company to perform any required service that your TuffTiger shall need. Steps 1 through 8 below should be performed by an authorized service company. Please call TuffTiger at (866)770.7785 for a service company near you.

Re-Start Procedures

1. Inspect the control panel and main power supply for condition and proper electrical connections. Use of a lockout tag out procedure is highly recommended during inspection of components, don't assume no one will turn the system on; you may be in for a shocking experience.

2. Aerator inspections, most situations where the aerobic system has set idle for a long period of time (months or years) the aerator needs to be thoroughly inspected. The aerator has an intake filter and therefore needs to be checked for dirty air filters or missing felts that must be on the filter body to operate properly.

3. Proper airflow is crucial to the operation of your TuffTiger system therefore an inspection by visual and audible means for the airflow properly activating (bubbling action) the aeration chamber is a must.

4. Have all tanks completely pumped out and immediately start refilling through the trash tank until the treatment plant is flowing into the pump tank. Allow enough water to enter the pump tank so that you can operate the pump float

switch to inspect the pump in normal operation.

5. Power up the control panel and observe aerator for proper audible condition. All systems vary, but the motor may sound overloaded for a few seconds until the water is pushed out of the lines and the aerobic system is operating properly. Inspect the alarm systems, aerator electrical power failure alarm or loss of air flow alarm, high water level alarms and all pump tanks. All visual and audible devices for each of these conditions should be in working order.

6. Disinfection device inspection, clean and re-stock tablet style stack tube chlorinators with 70% available calcium hypochlorite tablets labeled for use with

7. Inspect the disposal system for proper operation. If you did not install this system you should get a copy of the permitted design to insure that the system is operating as permitted.

8. Your TuffTiger System is now ready for prime time action! If you have not read

the operating instructions please do so before proceeding.

OPERATING INSTRUCTIONS

The TuffTiger System design provides an efficient reliable service. Yet as with all on-site wastewater treatment systems, it will require routine periodic preventive maintenance. Your wastewater system will function for many years with proper use and care by following the operating instructions listed below:

After the dealer has started the plant the treatment process is started by using your kitchen, washroom and toilet facilities. The microorganisms in the wastewater from your home will start the aerobic treatment process. NO yeast cakes, RID-X, or any other over the counter products should ever be flushed or put into any part of your on-site wastewater treatment system.

- 1. Your on-site wastewater system should only receive typical domestic wastewater.
- 2. Do not allow inorganic materials (plastic, condoms, cigarette butts, feminine napkins or tampons, cloth diapers etc.) to enter system.
- 3. Do not flush disposable or cloth diapers down the toilet. Only the diapers contents may be placed in the toilet and flushed.
- 4. Do not pour cooking oil, grease, paint or chemicals down drains or toilets that can kill bacteria.
- 5. Only small amounts of bleaches and cleaning detergents for washing clothes maybe disposed of into the system. Wash loads should be spread out over the day to prevent peak overloading.
- 6. The system will not operate to its maximum ability if volumetric overloading occurs, for instance leading toilets, faucets or excessive water usage may cause discharge of untreated wastewater.
- 7. Air conditioning or refrigerator/freezer condensate drains should not be allowed into the plant as the additional amount of water may cause hydraulic overloading to the plant. The condensate drains may enter at the pump tank or disposal field if the spray area or field is sized appropriately.
- 8. Lint from screens of clothing dryer's and washing machines should be disposed of in the trash.
- 9. Use of a garbage disposal should be kept to a minimum. Undigested food is very slow to degrade. A trash tank should be installed on any system with a garbage disposal.
- 10. Use of a water softener is allowed on your home or business; however you should not allow the backwash water to enter the aerobic treatment plant. This backwash water has a high salt content and may cause your aerobic system to become septic and the treatment process could fail. Please contact your dealer for information regarding state or local rules and your options.
- 11. Proper use of this or any other on-site wastewater system depends upon the proper organic loading and the life of the microorganisms. TuffTiger is not responsible for in-field operation of the system, other than structural and mechanical workings of the system. Overloading and/or abuse of the system can only be corrected by the user.
- 12. It is best to leave the systems power supply on and the aerator operational for summer/winter homes or camps with intermittent or weekend use, as this will keep the system from becoming septic and needing to be pumped and re-started each season.

ROUTINE SERVICE

In the event the control panel alarm light and/or buzzer are activated, call your local dealer. The name, address, and phone number should be attached to the front cover of the control panel. If the dealer information is not readable or missing, call TuffTiger for the nearest service dealer.

Routine on-site inspections for proper operation during the first two (2) years from the date of initial operation shall be performed by the dealer whom installed your TuffTiger System. The dealer will inspect and service the system at no charge unless additional service is required that is not warranty related. Between 45 and 30 days prior to the first two (2) years ending the dealer will offer a continuing service policy for a nominal annual fee.

Both initial and extended service policies are requirements of the NSF/ANSI 40 and the NSF International Certification Policies for Wastewater Treatment Devices. Some local or state regulations may require greater service or monitoring requirements. Consult with your local or state regulating authority for current sire specific laws that apply to your system.

Each routine on-site inspection of the system should be examined for proper operation by an authorized service provider. The predicted service associated with the system includes:

Treatment Plant

	Clean intake filters on top of the air compressor	4 - 6 months
2.	Replace intake filters on top of air compressor	3-4 years
3.	Pump sludge from plant (middle tank)	6-8 years *
4.	Rebuild or replace air compressor	4-6 years

Accessory Equipment

1.	Check amount of chlorine tablets in chlorinator	3-6 months
2.	Pump sludge from trash tank (first tank)	2-4 years *
3.	Pump sludge from pump tank (last tank)	6-8 years *

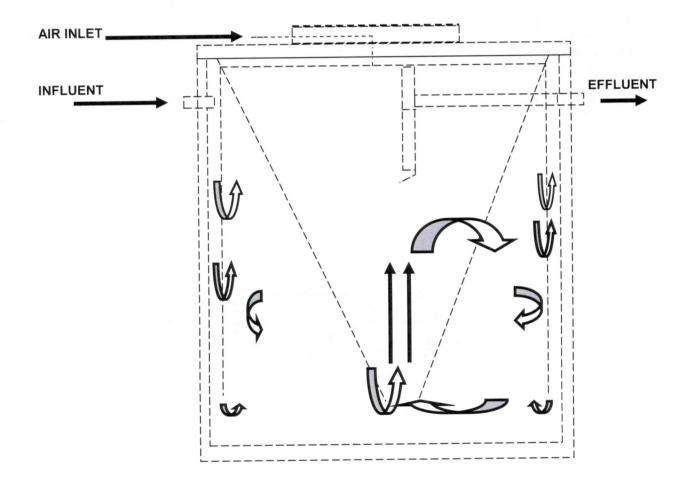
Note: Chlorine tablets are at the owner's expense. Sludge removed from any part of the system shall be at the owner's expense when necessary.

*Sludge removed from any part of the system must be disposed of in accordance to all state and federal regulatory requirements.

Shutting down your system for summer/winter homes or selling your home should be performed by the dealer shortly after the house is vacated. The dealer or contracted pumper shall pump the effluent from all tanks. Dealer will need tap water available to refill the tanks. Filling the tanks with water will insure that the tanks do not float or collapse while not in use and will be necessary for the re-start next summer/winter or for the new owner.

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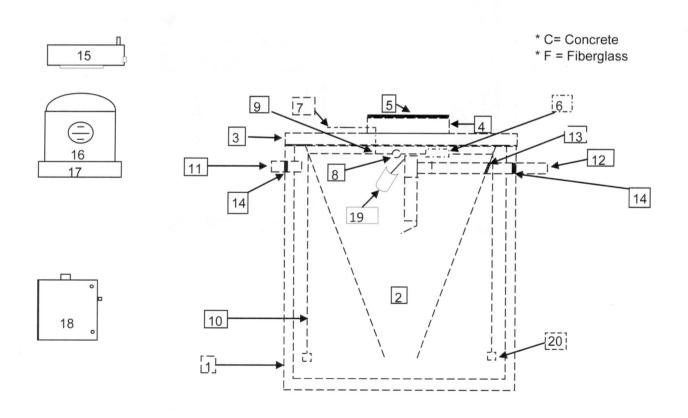
FLOW DIAGRAM



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PARTS LIST

ITEM DESCRIPTION	PART NO.	PART NO.	PART NO.	PART NO.	PART NO.
1. AERATION TANK	T-501C, F	T-601C, F	T-701C, F	T-1001C, F	T-1501C, F
F.G. CLARIFIER CONE	T-502	T-602	T-702	T-1002	T-1502
3. LID	T-503C, F	T-603C, F	T-703C, F	T-1003C, F	T-1503C, F
4. P.E. RISER 24" x 6"	T-504	T-604	T-704	T-1004	T-1504
5. P.E. RISER LID 24"	T-505	T-605	T-705	T-1005	T-1505
6. PVC UNION (TYP. 4)	T-506	T-606	T-706	T-1006	T-1506
7. PVC AIR INLET LINE	T-507	T-607	T-707	T-1007	T-1507
8. PVC FOUR WAY CROSS	T-508	T-608	T-708	T-1008	T-1508
9. PVC TEE	T-509	T-609	T-709	T-1009	T-1509
10. PVC AIR DROP LINE (TYP. 4)	T-510	T-610	T-710	T-1010	T-1510
11. PVC 4" SCH. 40 INLET	T-511	T-611	T-711	T-1011	T-1511
12. PVC 4" SCH. 40 OUTLET ASSY.	T-512	T-612	T-712	T-1012	T-1512
13. NEOPRENE SEAL	T-513	T-613	T-713	T-1013	T-1513
14. TS-4 RUBBER SEAL (TYP. 2)	T-514	T-614	T-714	T-1014	T-1514
15. AIR COMPRESSOR	T-515	T-615	T-715	T-1015	T-1515
16. AIR COMPRESSOR COVER	T-516	T-616	T-716	T-1016	T-1516
17. AIR COMPRESSOR BASE	T-517	T-617	T-717	T-1017	T-1517
18. CONTROL PANEL	T-518	T-618	T-718	T-1018	T-1518
HIGH WATER ALARM FLOAT	T-519	T-619	T-719	T-1019	T-1519
20. DIFFUSER (TYP. 4)	T-520	T-620	T-720	T-1020	T-1520



Design Specification

Model Number	Treatment Capacity (GPD)	Total Volume (Gallons)	Aeration Volume (Gallons)	Clarifier Volume (Gallons)
T-500	500	859	693	166
T-600	600	1028	828	200
T-750	750	1288	1038	250
T-1000	1000	1726	1393	333
T-1500	1500	2580	2082	498

LOADING RATES:

Model Number	BOD
T-500	1.25 LBS.
T-600	1.50 LBS
T-750	1.85 LBS.
T-1000	2.50 LBS.
T-1500	3.75 LBS.

Construction Materials:

Suffix C		Suffix F	
Aeration Tank	Concrete	Aeration Tank	Fiberglass
Aeration Tank Lid	Concrete	Aeration Tank Lid	Fiberglass
Clarifier	Fiberglass	Clarifier	Fiberglass
Access Riser	Polyethylene	Access Riser	Polyethylene
Access Riser Lid	Polyethylene	Access Riser Lid	Polyethylene

Construction Materials:

Air Line Distribution PVC
Diffuser Polyethylene
Discharge Piping PVC
Sample Tube PVC

Air Compressor See Air Compressor Parts List

Control Panel NEMA 4X
High Water Switch Polyethylene

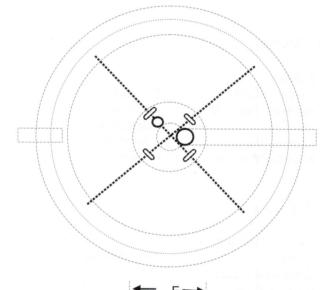
Electrical Requirements:

Model	Compressor	Motor Full Load Amps	Power Consumption	Electrical Requirements
T-500	LA-80BN	1.4	86 watts	115 volt-single phase
T-600	LA-100	1.7	95 watts	115 volt-single phase
T-750	LA-120	2.4	118 watts	115 volt-single phase
T-1000	HP-150	2.8	155 watts	115 volt-single phase
T-1500	HP-200	3.3	210 watts	115 volt-single phase

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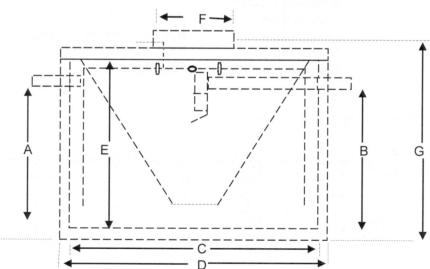
DIMENSIONAL DRAWING OF CONCRETE MODEL

Model Number Treatment Capacity		T-500C 500gpd	T-600C 600gpd	T-750C 750gpd	T-1000C 1000gpd	T-1500C 1500gpd
		01	31	31		. cccgpa
I.D. INLET	Α	4'-4"	5'-2 1/4"	6'-6"	6'-6"	7'-10"
I.D. OUTLET	В	4'-4"	5'-2 1/4"	6'-6"	6'-6"	7'-10"
AVERAGE TANK I.D.	C	5'-9 3/4"	5'-9 3/4"	5'-9 3/4"	6'-8 3/4""	7'-6"
TANK O.D.	D	6'-3"	6'-3"	6'-3"	7'-2"	7'-11"
TANK HEIGHT I.D.	E	5'-0"	5'-9 1/4"	7'-1"	7'-1"	8'-5"
RISER I.D.	F	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
GRADE LEVEL	G	5'-7"	6'-4 1/4"	7'-8"	7'-8"	9'-2"
WALL THICKNESS MINIMUM		2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
BOTTOM THICKNESS MINIMUM		3"	3"	3"	3"	3"
LID THICKNESS MINIMUN		3"	3"	3"	4"	4"



NOTE: When dosing using the T-500 for example, dosing should be 3 to 5 gallons per minute for 5 to 8 minutes at one to four hour intravals not to exceed 500 gallons per day.

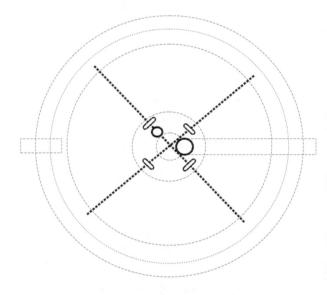
Larger models, gallons and dosing times can be increased appropriately.

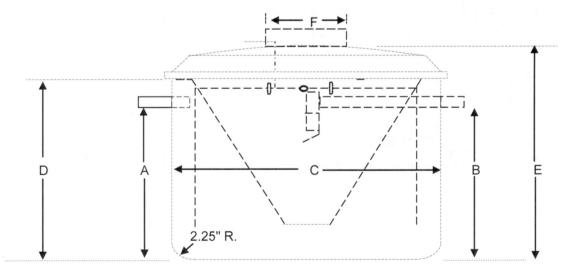


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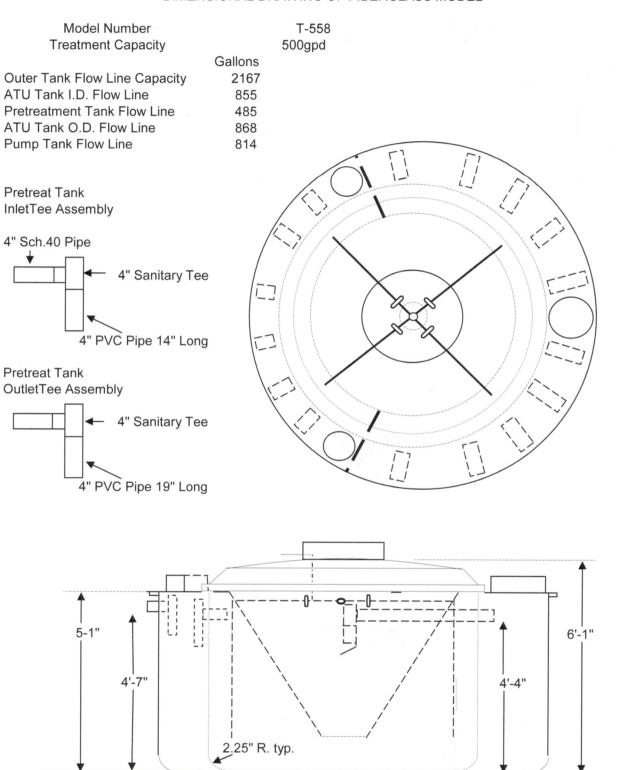
DIMENSIONAL DRAWING OF FIBERGLASS MODEL

Model Number Treatment Capacity		T-500F 500gpd	T-600F 600gpd	T-750F 750gpd	T-1000F 1000gpd	T-1500F 1500gpd
INLET HEIGHT I.D.	Α	4'-4"	5'-2 1/4"	6-'6"	6'-6"	7'-10"
OUTLET HEIGHT I.D.	В	4'-4"	5'-2 1/4"	6-'6"	6'-6"	7'-10"
TOP I.D.	C	6'-0 1/4"	6'-1"	6'-1"	6'-11 1/2"	7'-9"
BOTTOM I.D.	C	5'-7 3/4"	5'-7 3/4"	5'-7 3/4"	6'-6 1/2"	7'-3 1/2"
TANK HEIGHT I.D.	D	5'-0"	5'-9 1/4"	7'-1"	7'-1"	8'-5"
GRADE LEVEL	E	5'-11"	6'-10 1/4"	8'-0"	8'-3"	9'-7"
RISER I.D.	F	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
WALL THICKNESS MINIMUM		1/4"	1/4"	1/4"	5/16"	3/8"
BOTTOM THICKNESS MINIMUM		1/4"	1/4"	1/4"	5/16"	3/8"
LID THICKNESS MINIMUN		1/4"	1/4"	1/4"	5/16"	3/8"





DIMENSIONAL DRAWING OF FIBERGLASS MODEL



LIMITED WARRANTY

TuffTiger warrants the parts in each on-site wastewater system to be free from defects in material and workmanship for a period of two years from the date of installation treating domestic wastewater. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply. Sole obligation under this warranty is as follows: TuffTiger shall fulfill this warranty by repairing or exchanging any component part, F.O.B. factory that in TuffTiger's judgment shows evidence of defects, provided said component part has been paid for and is returned through an authorized dealer, transportation prepaid. The warrantee must also specify the nature of the defect to manufacturer.

The warranty does not cover treatment processes that have been flooded, by external means, or that have been disassembled by unauthorized persons, improperly installed, subjected to external damage due to altered or improper wiring or overload protection.

This warranty applies only to the treatment process and does not include any of the residential wiring, plumbing, drainage, or disposal system. TuffTiger is not responsible for any delay or damages caused by defective components or material, or loss incurred because of interruption of service, or for any other special or consequential damages or incidental expenses arising from the manufacture, sale, or use of this system.

TuffTiger reserves the right to revise, change, or modify the construction and design of the system for domestic wastewater or any component part of parts thereof without incurring any obligation to make such changes for modifications in previously sold equipment. TuffTiger also reserves the right, in making replacements of component parts under this warranty, to furnish a component part which, in its judgment, is equivalent to the company part replaced.

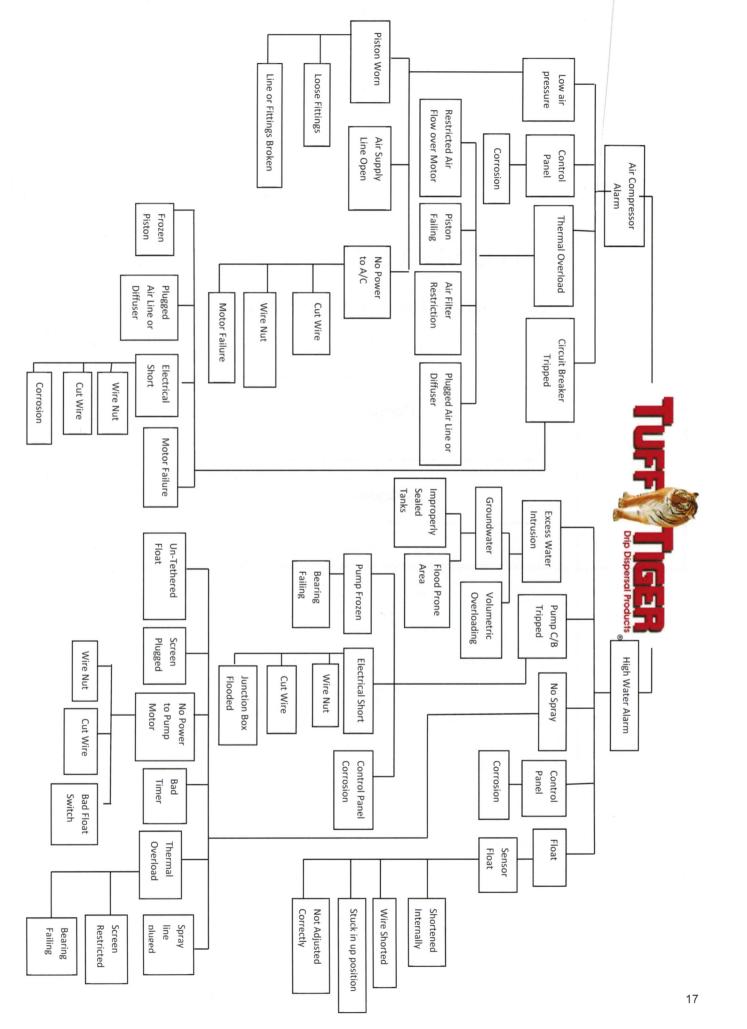
Under no circumstances will TuffTiger be responsible to the warrantee for any other direct or consequential damages, including but not limited to profits, lost income, labor charges, delays in productions, and/or idle productions, which result from defects in material and/or workmanship of the system. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty is expressly in lieu of any other expressed or implies warranty, excluding any warranty of merchantability or fitness, and of any other obligation on the part of TuffTiger.

This warranty gives you specific legal rights. You may also have other rights, which vary, from state to state.

TuffTiger Two Year Initial Service Policy

Date:	
this date is the date of sale by the builder. For date the notice of approval is issued by the per (scheduled once every 6 months over the interpretable components)	will inspect and service your nitial operation. For a new single family dwelling, ran existing single family dwelling, this date is the rmitting authority. A total of four inspection visits itial two year period) during which the electrical, are inspected, adjusted and services. An effluent sment for color, turbidity, and scum overflow, and SF/ANSI requirements.
State or local regulations may require more fre required number and frequency of visits that are more stringent than stated above.	quent inspection visits. Our firm will list below the this system will receive if state or local regulations
Number of inspections for the initial (2) year per be every month's.	period Frequency of inspections will
permitting authority and a third copy shall	record shall be completed signed and dated. The ovider, a second copy shall be sent to the local be sent to the owner. List the appropriate test BOD Grab, TSS Grab or Fecal Coliform) that is ecific site below:
Owner is responsible for keeping chlorine to application, overland disposal or direct dischar to be the responsible party he/she must sign an	ablets in the chlorination device for any surface ge disposal method. If the service provider agrees d print name below:
Emergency service shall be available within 48	hours of a service request.
A notice shall be given without delay to the own corrected at the time of routine inspection correction.	ner/operator of improper operation that cannot be or emergency service with an estimated date of
At least 45 days prior to the expiration of this p on an annual basis, with terms comparable to th	olicy, out firm will offer an extended service policy nose in this initial services policy.
nours, disconnecting the alarm system, restri	electrical current to the system for more than 24 acting ventilation to the aerator, overloading the eg excessive amounts of harmful matter into the
THIS POLICY DOES NOT INCLUDE PUN SYSTEM IF	MPING SLUDGE FROM ANY PART OF THE NECESSARY.
Service Provider Co Name (Please Print)	Owner/Operator Name: (Please Print)
TuffTiger Certified Individual (Please Print)	
Certified Individual Signature	Owner/Operator Signature



FOR SERVICES CALL

AUTHORIZED SERVICE PROVIDER

Company Name

Phone

281-441-7824

Address Surface co egnail. (on

> SURFACE COMPANY 16033 N. CHARPIOT HUMBLE, TX 77396