

**Review of**  
**Systems for Restaurant Wastewater Pretreatment**

By

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## **1. Introduction**

### 1.1 Problem Statement

In many Texas cities, wastewater discharges from restaurants may require pretreatment for reduction of fats, oils, and greases (FOG) before discharge into the sewage collection system. Failure to provide pretreatment may result in surcharges as high as \$30,000 per year. Conventional grease traps may not be able to adequately remove the FOG from the hot wastewater stream generated by normal dish and pot-washing. The Texas On-Site Wastewater Treatment Research Council (TOWTRC) recently approached the Texas Tech University Water Resources Center (TTUWRC) and requested a review of the currently available pretreatment systems.

### 1.2 Objectives

The objectives of this project can be summarized as follows.

- Gather information about current FOG pretreatment systems for restaurants through a survey of professional publications and promotional materials from manufacturers, with further direct contacts as appropriate.
- Perform a desktop evaluation of the FOG pretreatment systems for relative expense, flexibility, and potential for retro-fitting.
- Recommend one or more FOG pretreatment systems for demonstration in restaurants selected by the TOWTRC.
- Compile a report that summarizes the findings.

### 1.3 Approach

The gathering of information utilized multiple sources. Professional magazines that support the restaurant industry were reviewed for articles and advertisements on FOG

pretreatment. Unfortunately, little information was available through this venue. The most useful approach employed the internet to identify websites for manufacturers and suppliers of FOG pretreatment systems. When possible and appropriate, manufacturers or suppliers of interesting systems were contacted for further details and possible testimonials. As is shown later in this report, surprisingly few pretreatment devices or techniques could be found. In addition, the FOG pretreatment requirements and wastewater surcharges were reviewed for several cities across the State of Texas.

The FOG pretreatment systems were critically evaluated to clarify the treatment process employed, claimed removal rates, range of flows and FOG concentrations, operational and maintenance requirements, and apparent feasibility of success. Special notice was given to costs of installation, operation, and maintenance. The ease of adaptability of the systems for retrofitting in existing facilities was a major consideration.

During the project duration, the TOWTRC identified a restaurant in Austin for demonstration of a selected FOG pretreatment system. The following report identifies two types of treatment devices that should be considered for the “real world” demonstration.

## **2. City Regulations that Impact Restaurant Wastewater Discharges**

Most municipalities in Texas provide wastewater treatment for their residential, commercial, institutional, and industrial customers. The municipalities typically classify their wastewater collection and treatment services under water utilities or public works. In addition, the cities may organize a specific office to deal with industrial pretreatment issues to protect their collection systems and wastewater treatment plants. FOG and other restaurant wastewater components may fall under the jurisdiction of the industrial pretreatment guidance. For this section of this report, the requirements of several Texas cities were surveyed. The results show that the details of local guidance may greatly influence the level of concern and the selected FOG pretreatment devices.

The cities checked were Austin, Corpus Christi, El Paso, Fort Worth, Houston, and Lubbock. These cities all had easily accessible websites or telephone contacts to provide the required information. In general, all cities checked encourage application of a properly sized grease interceptor. Some cities, such as Austin and Lubbock, refer directly to the Uniform Plumbing Code design procedure shown in Figure 1. Others, like Fort Worth, encourage customers to contact the city office for the recommended procedure, which is likely to be that in Figure 1. All six cities have surcharges, added to the basic connection fee and flow charge, based on excess amounts of BOD<sub>5</sub>, TSS, and/or COD. Table 1 shows the limits and surcharges for these cities. FOG limits are set from 100 to 250 mg/L as shown, but no surcharges are applied to date. Exceeding the FOG limit during a sampling event puts the discharger into non-compliance, usually with some time, typically a few months, allowed to rectify the problem. The city ordinances are often written to allow daily penalties of up to \$2000 for violations, but these penalties are not usually applied for small FOG offenses.

Table 1. Typical City Wastewater Discharge Limits and Surcharges

Parameter	Unit	Austin	El Paso	Corpus Christi	Fort Worth	Houston	Lubbock
FOG	limit (mg/L)	100	100	200	na <sup>1</sup>	na	250
BOD <sub>5</sub>	limit (mg./L)	200	300	250	0	350	250
	surcharge (\$/lb)	0.4867	0.15	0.2372	0.248	0.1938	0.2333
TSS	limit (mg/L)	200	300	250	0	375	250
	surcharge (\$/lb)	0.1049	0.14	0.1704	0.124	0.4138	0.1687
COD	limit (mg/L)	450	na	562	na	na	na
	surcharge (\$/lb)	0.2255 <sup>2</sup>	na	0.0000	na	na	na

Note 1. Applied only if COD/BOD<sub>5</sub> is above 2.25.

Note 2. “na” means value not readily available in this city.

Austin “prohibits” and Lubbock “discourages” addition of bacteria, enzymes, or chemical emulsifiers to grease traps or interceptors. This stance is based on multiple concerns. First, the amendments can send the FOG on through the grease trap or interceptor, defeating its purpose. Second, the wastewater temperature is often higher than that for which the bacterial or enzymatic amendment was developed by its manufacturer. Third, if the separable grease is melted or emulsified by the amendment, the product typically increases the FOG in the discharged, wastewater, meaning that reducing the grease buildup to reduce odor and maintenance problems can turn into an observable violation in the wastewater analysis. Houston and Corpus Christi allow application of natural microbial treatments only after city approval. At least one such product, BioStim’s Formula KB-VF, has been received favorably to date. That product is discussed in a later section of this report.

The Industrial Waste Division of the Texas Commission on Environmental Quality has generated language for an example “Model Standards for a Grease Ordinance” (James 2004). This document is intended to standardize language across the state, and to give cities a template if they do not have their own. The model standards require a grease trap/interceptor “in accordance with locally adopted plumbing codes or other applicable ordinances,” allowing the

# Grease Interceptor Sizing Worksheet

The Uniform Plumbing Code Formula

<b>Company</b>		<b>Calculated By</b>		<b>Date</b>		
<b>Project</b>		<b>Location</b>				
Follow these six simple steps to determine grease interceptor size.						
Enter Calculations Here >	No of Meals Per Peak Hours  Step 1	Waste Flow Rate  Step 2	Retention Time  Step 3	Storage Factor  Step 4	Calculated Interceptor Size  Step 5	Grease Interceptor  Step 6
>	x	x	x	=		
1	<b>Number of Meals Per Peak Hour (Recommended Formula):</b> Seating Capacity x Meal Factor = Meals per Peak Hour  <b>Establishment Type:</b> Fast Food (45 min)                      Meal Factor 1.33 Restaurant (60 min)                      1.00 Leisure Dining (90 min)                      0.67 Dinner Club (120 min)                      0.50				<b>Notes:</b>	
2	<b>Waste Flow Rate:</b> <b>Condition</b> <b>Flow Rate</b> With a Dishwashing Machine              6 Gallons Without a Dishwashing Machine          5 Gallons Single Service Kitchen                      2 Gallons Food Waste Disposer Only                  1 Gallon				<b>Notes:</b>	
3	<b>Retention Time</b> Commercial Kitchen Waste Dishwasher      2.5 Hours Single Service Kitchen Single Serving          1.5 Hours				<b>Notes:</b>	
4	<b>Storage Factor</b> <b>Kitchen Type</b> <b>Storage Factor</b> Fully Equipped Commercial Hours of Operation 8 Hours    1.00 12 Hours    1.50 16 Hours    2.00 24 Hours    3.00 Single Service Kitchen                          1.50				<b>Notes:</b>	
5	<b>Calculate Liquid Capacity</b> Multiply the values obtained from step 1, 2, 3 and 4. The result is the approximate grease interceptor size for this application				<b>Notes:</b>	
6	<b>Select Grease Interceptor</b> Using the approximate required liquid capacity from step 5, select an appropriate size as recommended by the manufacturer.				<b>Notes:</b>	

Figure 1. Uniform Plumbing Code Worksheet

cities to accept the Uniform Plumbing Code or to add other local requirements. The grease trap/interceptor must be evacuated every 90 days unless the owner/operator can prove with analyzed samples that the effluent still meets the local requirements with evacuation every 180 days. No numerical limits are set for FOG, BOD<sub>5</sub>, COD, or TSS, nor are surcharge unit costs set, leaving these decisions up to the city based on its customer base, collection system, and wastewater treatment capabilities. Introduction of surfactants, solvents, and emulsifiers such as enzymes, soap, diesel, kerosene, terpene, and other solvents to clear a grease trap/interceptor is prohibited. Alternative pretreatment technologies, such as “bioremediation media,” are not discouraged if laboratory testing can prove that the microbial media can withstand the range of water quality and temperature typical to a real restaurant wastewater without increasing the foam, BOD<sub>5</sub>, COD, and TSS in the wastewater, and if the local publicly owned treatment plant approves of the pretreatment process. A basic penalty schedule of up to \$2000 per offense is also proposed.

It should be noted that the typical enforcement of municipal wastewater pretreatment rules does not require that conventional grease interceptors be properly sized before the restaurant can begin to discharge wastewater. It is possible for a new restaurant to be built and begin operation with plumbing connections and buried grease interceptor tank(s) that do not meet city guidelines and/or produce wastewater with excessive FOG. In addition, if a restaurant is taken over by a new owner who changes the operations and unintentionally makes the FOG problems worse, such as increasing the number of meals served per peak hour, the existing grease interceptor may be inadequate for the increased FOG loading. In both cases, most cities choose the alternative of adding surcharges to the restaurant’s wastewater bill rather than force upgrading of the FOG handling process. It is up to the restaurant owner to make the economic

decision to trade the ongoing monthly surcharge for a new capital investment in a new larger grease interceptor or other FOG pretreatment device and additional operation and maintenance costs for more frequent grease removal or more complex processing. The surcharge system generates revenue for the city that is justified as putting the greater burden on generators of the strongest wastewater that can impact both the collection and treatment infrastructure. As surcharged restaurant owners upgrade their FOG systems, the city revenue will decrease. Municipal wastewater rate setting must wisely consider this issue.

### **3. Alternatives to Meet FOG Requirements for Restaurant Wastewater**

#### **3.1 Proper Sizing and Maintenance of Grease Interceptors**

Based on the findings in the previous section, the preferred method for handling restaurant FOG in Texas municipalities is a properly sized grease interceptor (Kommalapati and Johnson 2001). Figure 1 provides the design parameters for sizing these devices. As shown in the figure, the design procedure includes the number of meals served in peak hours, typical dining time, kitchen size, dishwashing device, and hours of operation. As stated previously, the initial construction of a new restaurant should include proper sizing and plumbing of a grease interceptor based on the planned values of the variables in the design calculations. After the conventional grease interceptor tank system is in the ground, it is typically much more expensive to remove a small, inadequate tank system and replace with a larger adequate tank system than it would have been to install the larger adequate system initially. It is also possible that changing the type of restaurant operations in a given facility can increase the FOG generation rate enough to make a previously adequate grease interceptor system incapable of meeting the municipal wastewater guidelines.

The first option with an undersized grease interceptor is increasing the frequency of maintenance in the form of vacuum pumping of the tanks, which increases maintenance costs. Replacement of a small grease interceptor with a larger one can easily exceed \$20,000 in construction costs. Actual costs will vary depending on the size of the systems to be installed and the complexity of construction at the restaurant site. The magnitude of these costs makes it worthwhile for some establishments to consider other pretreatment options that might be economical for their circumstances. The following sections describe several viable options currently on the market and available to Texas restaurant owners.

## 3.2 Physical Pretreatment

In this section, physical pretreatment is defined as simple separation of FOG from the wastewater flow without chemical or biological transformation. A small scale alternative was found that represents low capital investment, but with high maintenance requirements due to low holding capacity. Large scale alternatives have larger capital costs and energy costs, but require less frequent personal attention due larger holding capacity for removed FOG.

### 3.2.1 Small Scale Filtration

One example of a small scale system was identified. The Zabel A300™-12 series (Zabel Environmental Technology 2003) is marketed as a filter that can be placed upstream of a grease trap/interceptor. The filter removes materials larger than 1/32 inch, and the manufacturer claims reduction of FOG by 50 to 98 percent. The filter is in the form of replaceable cylindrical cartridges approximately 12 inches in diameter and 20, 28, or 36 inches in height, held in appropriately sized cases. The filter case is installed directly in the influent pipe inside the grease interceptor. The manufacturer's suggested retail prices of the cases and cartridges are listed in Table 2. An alarm and switch combination to signal cartridge replacement is available for \$141.95 as part AC-A-I-SF. Figure 2 shows a filter case, cartridge, and alarm/switch.

Table 2. Zabel A300™-12 Filter Costs

Nominal Length (in)	Unit Costs (\$)	
	Case	Cartridge
20	200.95	154.95
28	273.95	180.95
36	346.95	206.95

This filter system is promoted as being able to reduce FOG by 60 to 90 percent within 6 months of installation. This delay is likely due to the device's influence being only on the influent flow, meaning that the grease interceptor's effluent quality will slowly improve as the

higher FOG wastewater previously in the tank is slowly flushed from the tank. No guidance is given on the life of each filter cartridge, and it is assumed that the filter cartridges are disposed of as solid waste. Obviously, restaurant maintenance staff must be responsible for removal and replacement of the filter cartridges.

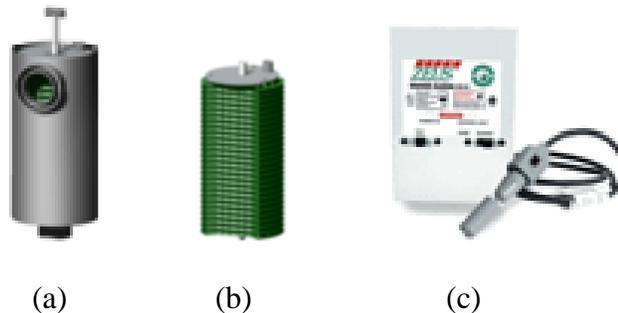
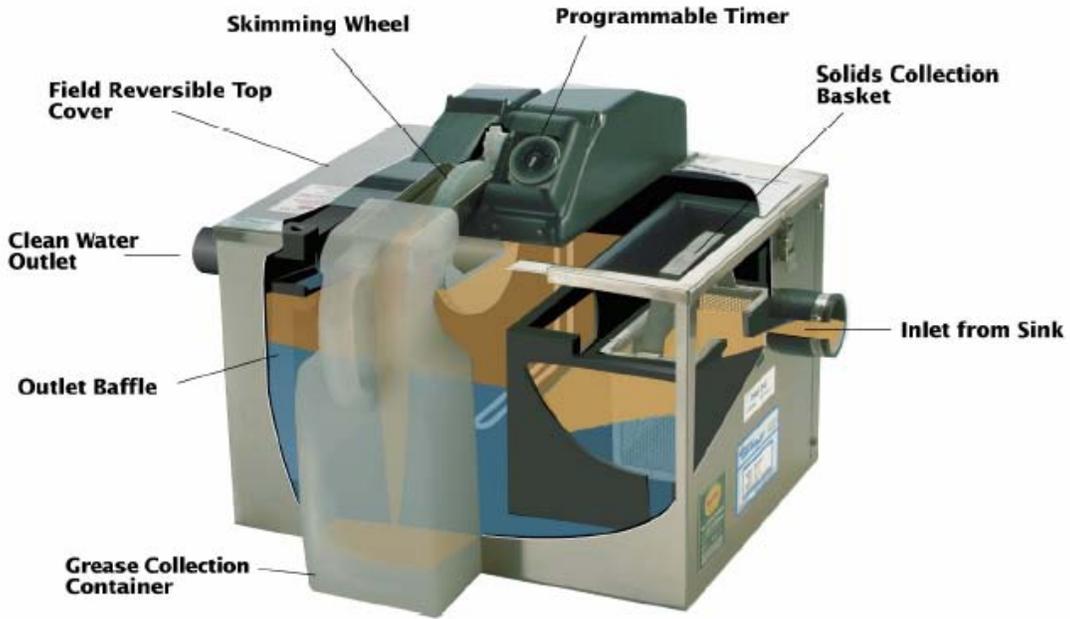


Figure 2. Zabel A300™-12x28 (a) filter case, (b) filter cartridge, and (c) alarm with switch (all not to scale).

### 3.2.2 Large Scale Mechanical Grease Removal

Another approach is to provide an indoor automatic grease removal device. These devices are based on industrial oil/water separators that use a tank to allow oil and water separation, due to density difference, and employ an oleophilic material to remove floating oil, followed by transport of the removed oil into a collection container. The systems for restaurant FOG removal require the FOG in liquid phase as well, so inorganic solids separation and heating elements are included in the tanks for optimal FOG liquification. The inorganic solids are retained by a strainer device, and the wastewater and FOG pass into the tank, where baffles encourage FOG accumulation. A heating element, typically on a timer, heats the water and trapped FOG to liquefy the FOG for collection by a skimming disk. A wiper blade strips the FOG off the skimming disk and into a collection container, which would require maintenance. Two vendors with similar products were identified.

The Big Dipper® family of equipment is manufactured by Thermaco, Inc., and marketed through regional representatives (Thermaco 2004). Two devices have potential application for single restaurants. One is known as the Internal Strainer (IS) series, and this family is capable of handling kitchen flows of 20 (Model W-200-IS) to 75 gpm (W-750-IS). Figures 3 to 5 provide graphical descriptions of the unit family and demonstrate a typical installation at a pot sink or pre-rinse station, such as would be appropriate for the 20 to 30 gpm models. The larger flow units are intended for larger restaurant kitchen applications. Complete technical descriptions are provided in the Appendix. An internal solids strainer basket allows collection of large solids, and the basket capacity is 1.2 gal for flow rates up to 25 gpm or 2.5 gal for the larger IS units. The strainer basket requires manual maintenance. Each unit has a programmable timer to set the heating/liquefied FOG removal cycle. The grease containers hold 6 qt. The purchase price range for this series ranges from approximately \$4,000 for the W-200-IS to \$14,000 for the W-750-IS. Plumbing connection costs will vary depending on the actual kitchen conditions. The other device family is called the Automatic Solids Transfer (AST) series, which has units with capacities ranging from 30 (W-300-AST) to 100 gpm (W-1000-AST). These systems are intended for larger facilities, like hospitals or casinos, that have centralized grease removal from multiple fixtures. AST series examples are shown in Figures 6 and 7. AST units have a solids strainer and collection chamber, and the collection chamber is cleared by a water-driven eductor periodically, and the solids are diverted to the outlet of the unit. This mechanism requires a separate facility-supplied flow of 5 gpm. The grease collection part of the unit is similar to the IS unit. The grease collection containers can range from 11.6 qt to a 55-gal drum. The purchase prices range from \$8,500 for the W-300-AST to \$27,000 for the W-1000-AST. Again, plumbing costs will vary. For both series, the costs associated with grease disposal will depend on the



Cutaway Drawing of Big Dipper® W-200-IS

Figure 3. Big Dipper® Internal Strainer (Thermaco 2003)

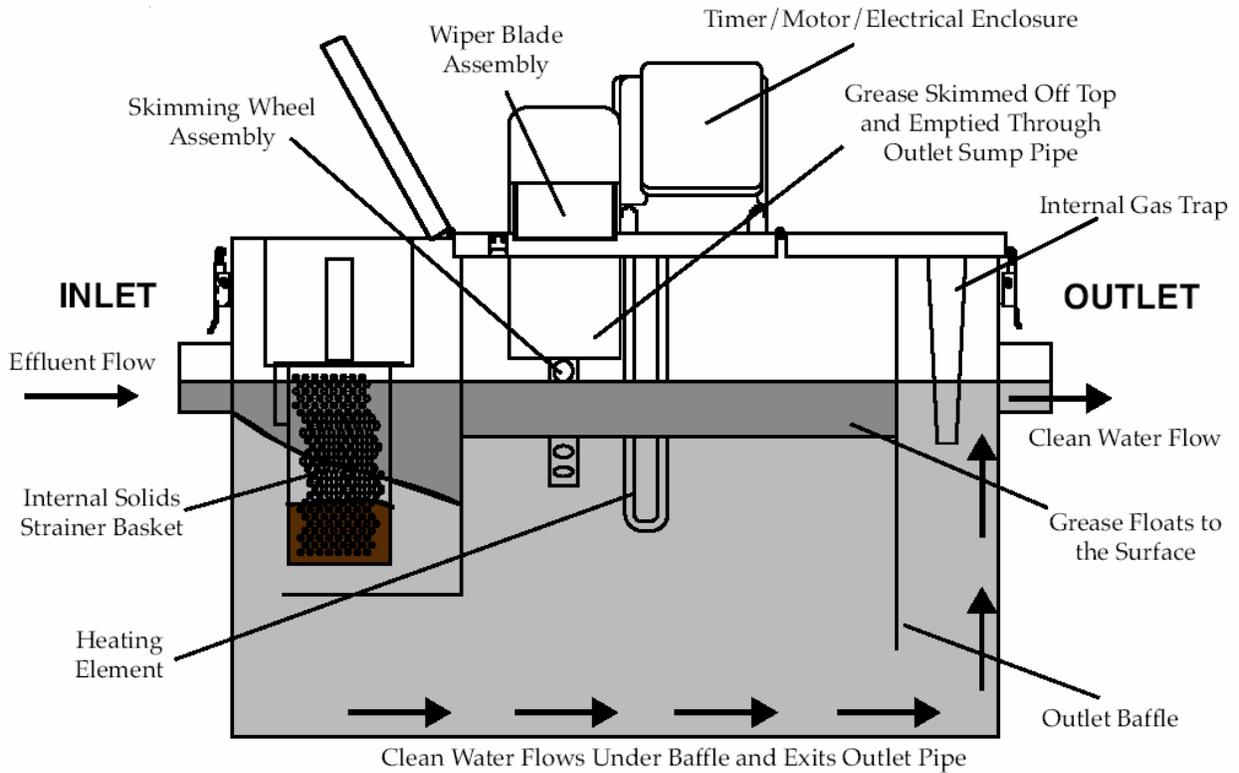


Figure 4. Cross-sectional Detail for IS Unit (Thermaco 2003)



**BIG DIPPER® W-200-IS**

Figure 5. Typical Installation for W-200-IS Unit (Thermaco 2003)



**BIG DIPPER® W-300-AST**



**BIG DIPPER® W-750-AST**

Figure 6. Big Dipper® Automatic Solids Transfer Units

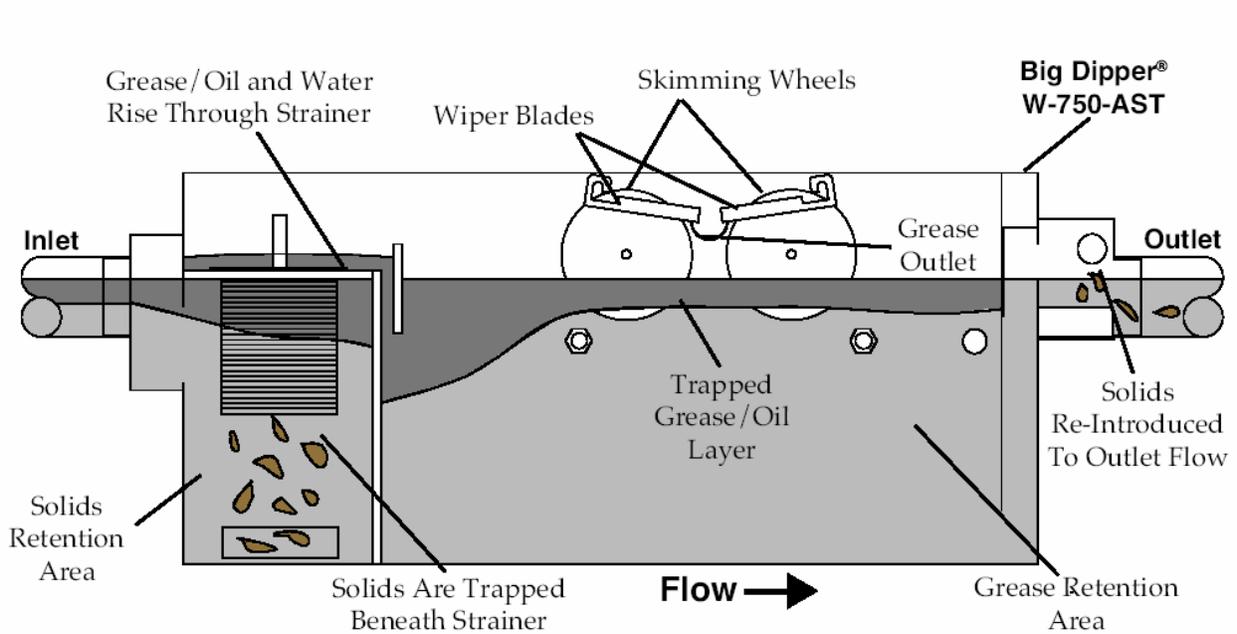


Figure 7. Cross-sectional Detail for AST Unit (Thermaco 2003)

local grease disposal service providers. Both units could potentially be retro-fitted into existing restaurant kitchens.

Thermaco (2003) claims greater than 98 percent FOG removal capability. The company's literature includes case histories from fast food restaurants, cafeterias, full service restaurants, airports, supermarkets, malls, casino/resorts, universities, hospitals, and food processors. The company literature is thorough and offers design assistance and specification sheets.

Highland Tank and Manufacturing Co. markets a device series called the Highland Tank Automatic Grease Inceptor (HT-AGI) that is very similar to the Big Dipper® IS series (Highland Tank 2003). Their literature claims that Highland Tank originally developed the Diskimmer™ plastic disc technology. The range of flow capacities intended for single restaurant applications is from 15 (Model AGI-15) to 100 gpm (AGI-100). Figures 8 and 9 depict the smaller devices

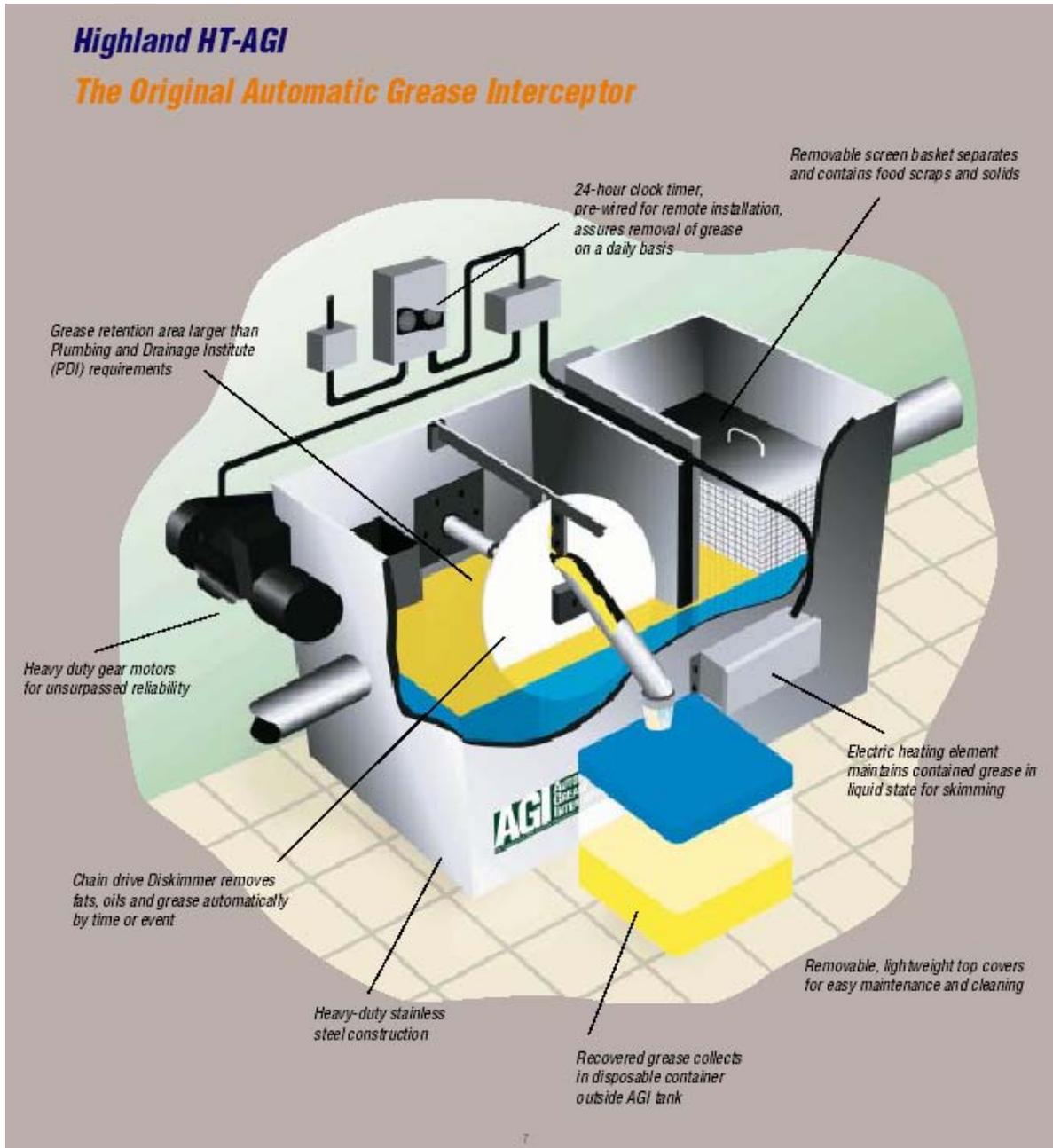


Figure 8. Conceptual Description of HT-AGI Series (Highland Tank 2003)

with small capacity grease containers at 2 gal or less. Figure 10 shows a non-dimensional cross-section of a larger version that allows a 55-gal drum as the grease container. The purchase price range is from \$3,400 for the AGI-15 to \$11,000 for the AGI-100. As with the other system, plumbing and grease disposal costs will vary by location.



Figure 9. Smaller HT-AGI Unit (Highland Tank 2003)

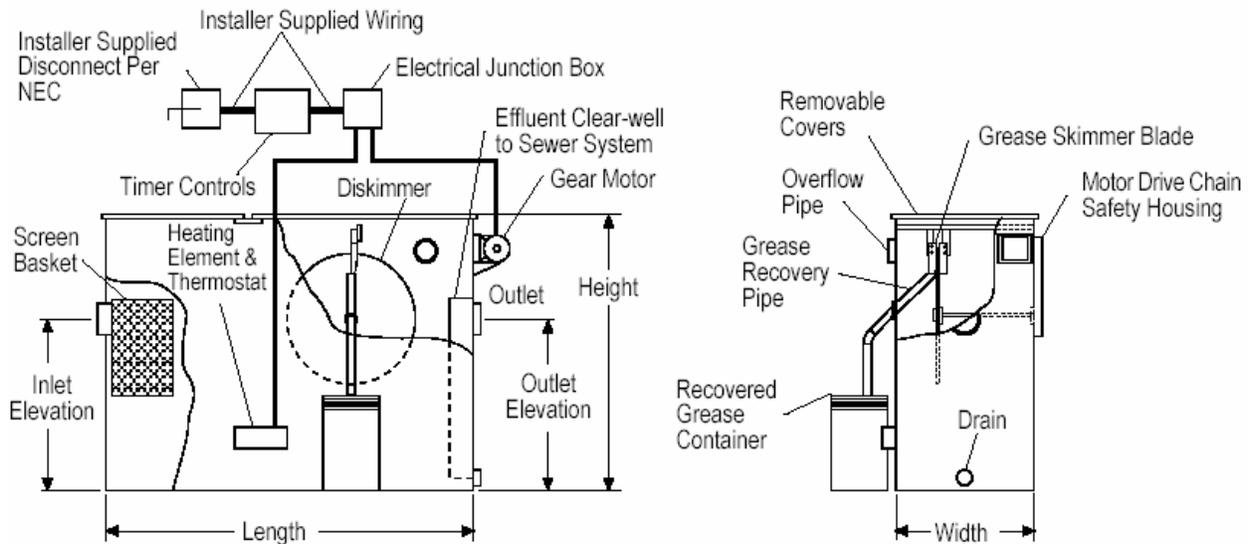


Figure 10. Schematic Cross-section of HT-AGI Units (Highland Tank 2003)

Highland Tank (2003) claims in its literature that, if properly maintained, the HT-AGI series can reduce FOG in the effluent wastewater to below 100 mg/L. Additional details about this series are provided in the Appendix. The devices in this series could be retro-fitted into existing kitchen wastewater plumbing systems. The company literature refers to typical applications similar to those listed by Thermaco (2003). The company also makes conventional “passive” grease interceptor tanks.

In summary, both vendors of automatic grease removal devices provide similar mechanical processes and their purchase price ranges overlap. The price ranges provide several units that are much cheaper than a new or replacement properly-sized grease interceptor tank system. The AST series has the added ability to automatically flush non-FOG solids into the pretreated wastewater discharge, and it is not clear that this advantage is always a benefit. In general the devices have the following advantages if placed upstream of an inadequate grease interceptor tank system.

- Reduces grease that makes it to the outdoor grease interceptor tank system
- Can extend time between pumping of grease interceptor tank system
- Includes heater to liquefy FOG for collection
- Capital cost likely less than replacement of grease interceptor tank system

The following disadvantages must also be remembered.

- Requires handling of collected grease by restaurant staff and grease haulers
- May increase operational and maintenance costs, but if existing system is out of compliance, the surcharges should be eliminated.

### 3.2.3 Addition of Microbial Grease Eliminators

The search found a number of products available that claim to use microbial cultures and their enzymes to break down FOG in grease traps and interceptors. The manufacturer websites had very similar descriptions, with all the products in Table 3 described as combinations of live bacteria, enzymes, and/or nutrients. When enzymes are listed, protease, amylase, cellulase, and lipase are mentioned for their abilities to break down proteins, starches, cellulose, and fat, respectively. Only BioStim provided multiple testimonial letters, including one from a grease trap inspector in Houston. As is shown in Table 3, the products come in powder, liquid, or gel forms. Treatment frequencies can be daily, weekly, monthly, or are unspecified. Unit costs and sizes of the units vary widely. A few of the product descriptions point out that initial grease trap treatments may necessarily be daily when treatment begins for a period of weeks or months, after which treatment frequency can decrease. This concern is most likely due to the time required to degrade the initial FOG buildup and flush those breakdown products through the grease trap or interceptor.

The attitudes of the municipal wastewater pretreatment authorities vary from city to city. Austin and Lubbock prohibit or discourage, respectively, the use of microbes or any additives that may simply move incompletely degraded FOG buildup from the grease trap or interceptor into the sanitary sewer. Houston has a list of approved vendors that provide microbial additives, such as BioStim's products, that are permitted in grease traps and interceptors in that city, but few individual products are listed by brand name. The proposed model grease ordinance (James 2004) includes the following recommended language.

Bioremediation media may be used with the POTW's approval if the person has proved to the satisfaction of the POTW that laboratory testing which is appropriate

Table 3. Typical Microbial Grease Trap Treatments

Product Name	Manufacturer/Distributor	Form	Cost \$/Unit	Unit	Use	Website
BioPill	BioStim	Gel	18.00	pill	Monthly	<a href="http://www.biostim.com">www.biostim.com</a>
KB-VF	BioStim	Powder	na <sup>1</sup>	na	Daily	<a href="http://www.biostim.com">www.biostim.com</a>
BZT® Waste Digester	United-Tech, Inc.	Powder	60.32	lb	na	<a href="http://www.vsitesecure.com">www.vsitesecure.com</a>
Bacti-zyme®	Microtack	Powder	9.00	kg	Daily	<a href="http://www.microtack.com">www.microtack.com</a>
6803 BAC Odor Control	Zim Intenational	Liquid	797.50	55 gal	na	<a href="http://www.zim-intl.com">www.zim-intl.com</a>
6877 Hydrolytic Enzymes	Zim Intenational	Liquid	387.50	50 lb	na	<a href="http://www.zim-intl.com">www.zim-intl.com</a>
6840 Survivors	Zim Intenational	Liquid	1146.75	55 gal	na	<a href="http://www.zim-intl.com">www.zim-intl.com</a>
Grease Gobbler	Texas Refinery Coatings, Inc.	Powder	na	na	na	<a href="http://www.texasrefinerycoatings.com">www.texasrefinerycoatings.com</a>
211 Bio-Flow	Zircon Industries	Liquid	na	55 gal	na	<a href="http://www.greenchem.com">www.greenchem.com</a>
Enviro-Zyme 314 GT 2X	Winston Company, Inc.	Liquid	na	na	na	<a href="http://www.winstoncompany.com">www.winstoncompany.com</a>
Scram™	Perma	Liquid	47.30	5 gal	Weekly	<a href="http://www.perma.com">www.perma.com</a>
DC-Baczyme	Interstate Products., Inc.	Liquid	99.80	45 lb	Weekly	<a href="http://www.interstateproducts.com">www.interstateproducts.com</a>

Note 1. “na” means information was not available from the manufacturer/distributor’s literature.

for the type of grease trap to be used has verified that:

(A) The media is a pure live bacterial product which is not inactivated by the use of domestic or commercial disinfectants and detergents, strong alkalis, acids, and/or water temperatures of 160°F (71°C).

(B) The use of the media does not reduce the buoyancy of the grease layer in the grease trap and does not increase the potential for oil and grease to be discharged to the sanitary sewer.

(C) The use of the bioremediation media does not cause foaming in the sanitary sewer.

(D) The BOD, COD, and TSS discharged to the sanitary sewer after use of the media does not exceed the BOD, COD, and TSS which would be discharged if the product were not being used and the grease trap was being properly maintained. pH levels must be between 5 and 11.

None of the marketing information for the microbial treatments in Table 3 included test results that approached the concerns listed in the model ordinance.

With the wide variations in wastewater flows and compositions between restaurants, it is difficult to confidently identify products that will be effective in all grease traps or interceptors. It is also difficult to estimate the proper dosage and frequency, and hence the costs, for microbial addition. The microbial additive vendors do not claim that evacuation of the grease trap or interceptor will be no longer necessary, nor do they make any claims about meeting FOG, COD, BOD, or TSS guidance. Apparently, the microbial additives were originally developed to move clogs, not treat FOG to low levels.

### 3.2.4 Combined Physical and Microbial Pretreatment

Two vendors were found who have developed alternatives to physical removal of FOG from restaurant wastewater that include microbial treatment. The goal of these devices is to greatly reduce or completely eliminate grease collection and disposal costs. The two devices are quite different, and only one actually has potential for retro-fits in urban settings.

The Nibbler™ was developed by the Stuth Company in the Pacific Northwest and is marketed through Northwest Cascade Stuth, Inc. (Northwest Cascade 2004). This pretreatment device is well known in the on-site wastewater treatment industry. The Nibbler™ is an aerobic treatment device that is shown conceptually in Figure 11. A Nibbler™ consists of a concrete tank, a plastic media mixing zone, air lift pumps to aerate and mix the fluids in the reactor, and a settling zone beneath the media. The presence of aerobic bacteria in the media make that part of the Nibbler™ a form of trickling filter that provides secondary treatment of organics in the influent. As the aerobic bacteria degrade the organics, they product biomass, which can slough downward. The upper part of the settling zone tends to be facultative and relatively clear, and the effluent flows from this zone. At the bottom of the tank, biomass settles and degrades anaerobically. The upper™ part of the tank receives air flow and is also vented. The Nibbler™ was developed to be part of a septic system, as shown in Figure 12. Figure 12 shows that the Nibbler™ must be preceded by a grease interceptor tank and surge tank to protect the microbial population. In that type of application, the final effluent that reaches the drainfield will be of much better quality than that from the grease interceptor or the septic tank. That application is most applicable to rural locations without city sanitary sewer availability. The cost of a Nibbler™ alone for a typical fast food restaurant with 2000 gpd wastewater flow and BOD<sub>5</sub> of 1,000 mg/L is approximately \$19,000 (Goodwin 2004). The cost of the entire system as shown

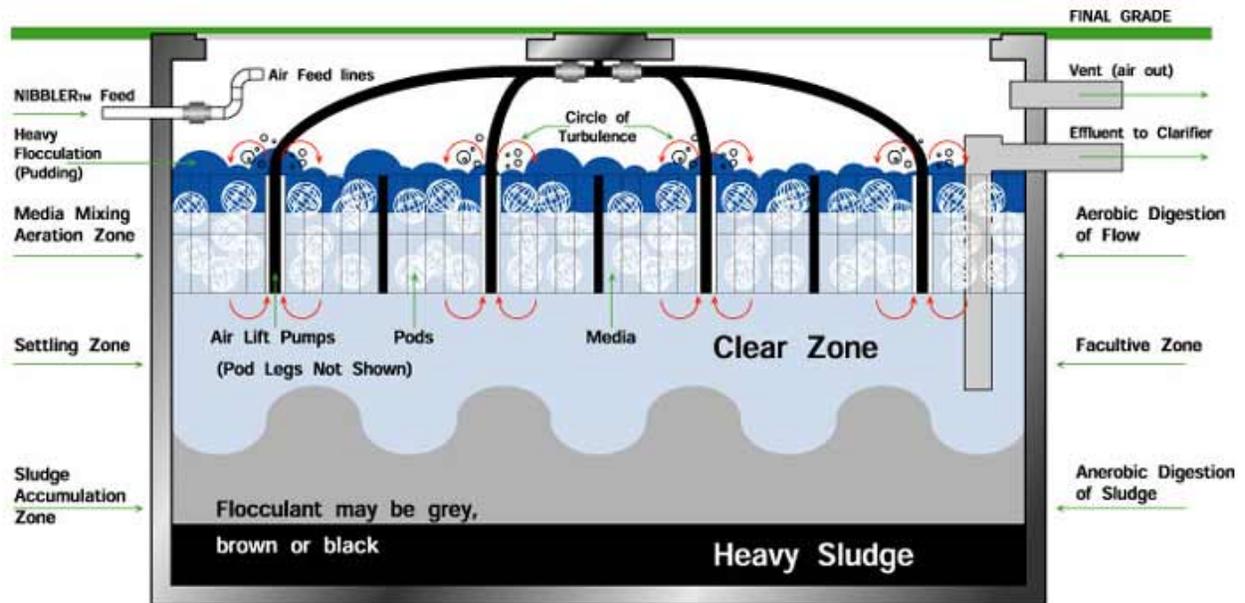


Figure 11. A Nibbler™ Unit (Northwest Cascade 2004)

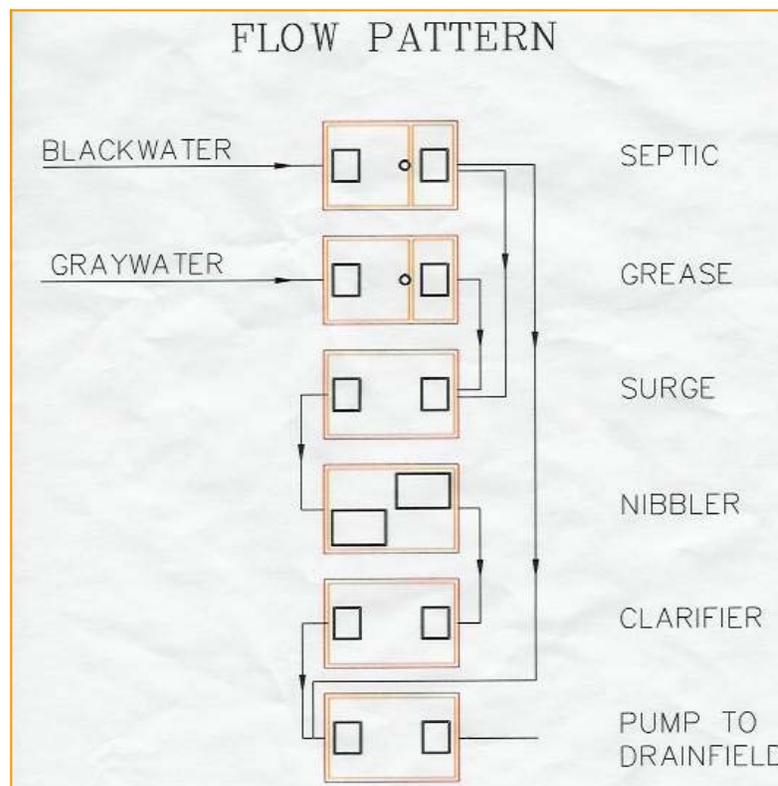


Figure 12. Position of a Nibbler™ in a Septic System (Northwest Cascade 2004)

in Figure 12 would be about \$38,000. As the main purpose of this project is to find devices that can be retro-fitted into urban restaurants that are violating urban sanitary sewer guidelines, the Nibbler™ is not a viable alternative.

A more appropriate alternative is the Remediator® developed by Jay R. Smith Manufacturing Company and marketed through regional vendors (Smith 2002). The manufacturer claims that the Remediator® system can remove over 99 percent of suspended solids larger than 2 mm with its solid interceptor, separate and retain over 99 percent of FOG, maintain a viable FOG-metabolizing biofilm using controlled application of a mixed microbial population, and dispose of FOG by microbial metabolism. The microbial population includes nine strains of “non-toxic and non-pathogenic” bacteria that have been selected for their “appetites” for FOG, sugar, starch, and other complex carbohydrates. The Remediator® Culture includes strains of *Bacillus*, *Pseudomonas*, *Arthobacter*, and *Micrococcus* bacteria. A conceptual diagram of a typical Remediator® system is shown in Figure 13. Figure 14 provides a side view schematic. The first unit is a solids interceptor with a removable strainer basket. Large solids must be removed to protect the processes downstream. The second unit is a biological reactor that uses attached growth biofilm to treat the organic matter in the wastewater. The plastic media structure for the biofilm is shown in Figure 16. Figure 17 is a photograph of the major components of a typical Remediator® system.

The manufacturer claims that effluent FOG concentrations will be below 100 mg/L, and removal of “non-grease” material is necessary only once or twice per year. The only moving part is the metering pump for the Remediator® Culture. The systems are sized for flow rates of 20 to 75 gpm. The typical list price for the Remediator® with the metering culture pump is \$7,500. The solids interceptor lists at about \$1,800 for cast iron and \$2,700 for acid resistant

The Jay R. Smith Mfg. Co. Fig. 8970  
 Remediator™ Grease Treatment System Isometric

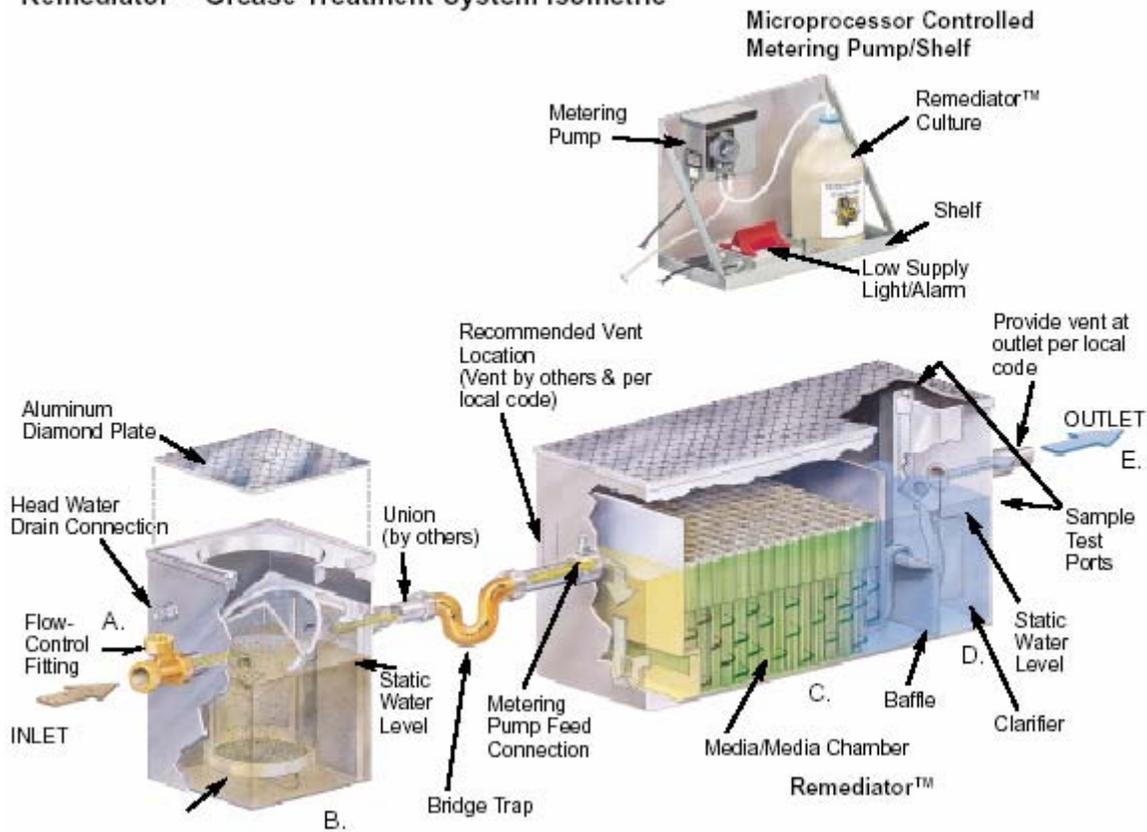


Figure 13. Conceptual Sketch of Remediator™ System (Smith 2002)

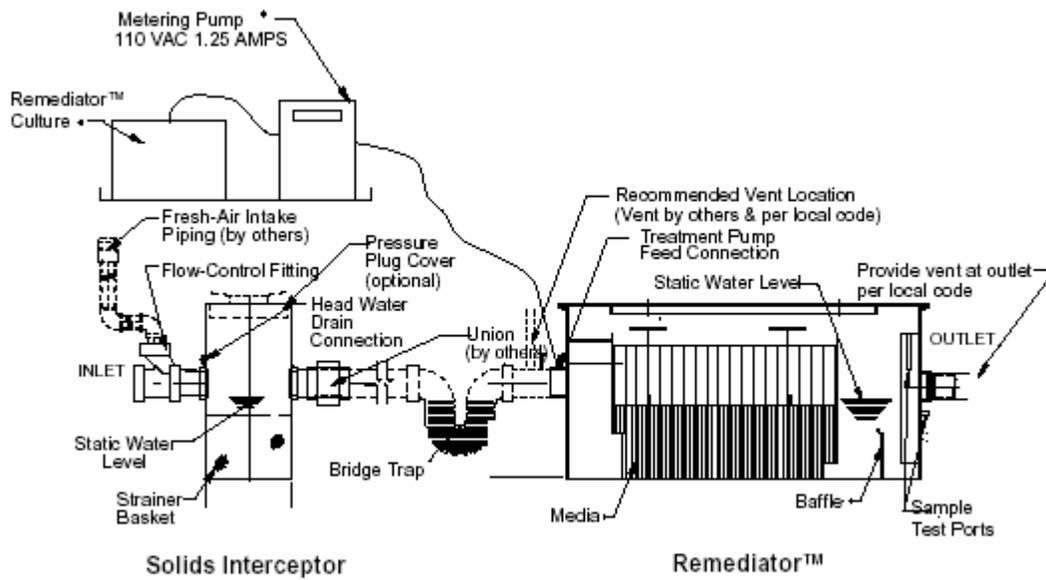


Figure 14. Side View of Remediator™ System (Smith 2002)



Figure 15. Typical Remediator™ Media for Microbial Attachment (Smith 2002)

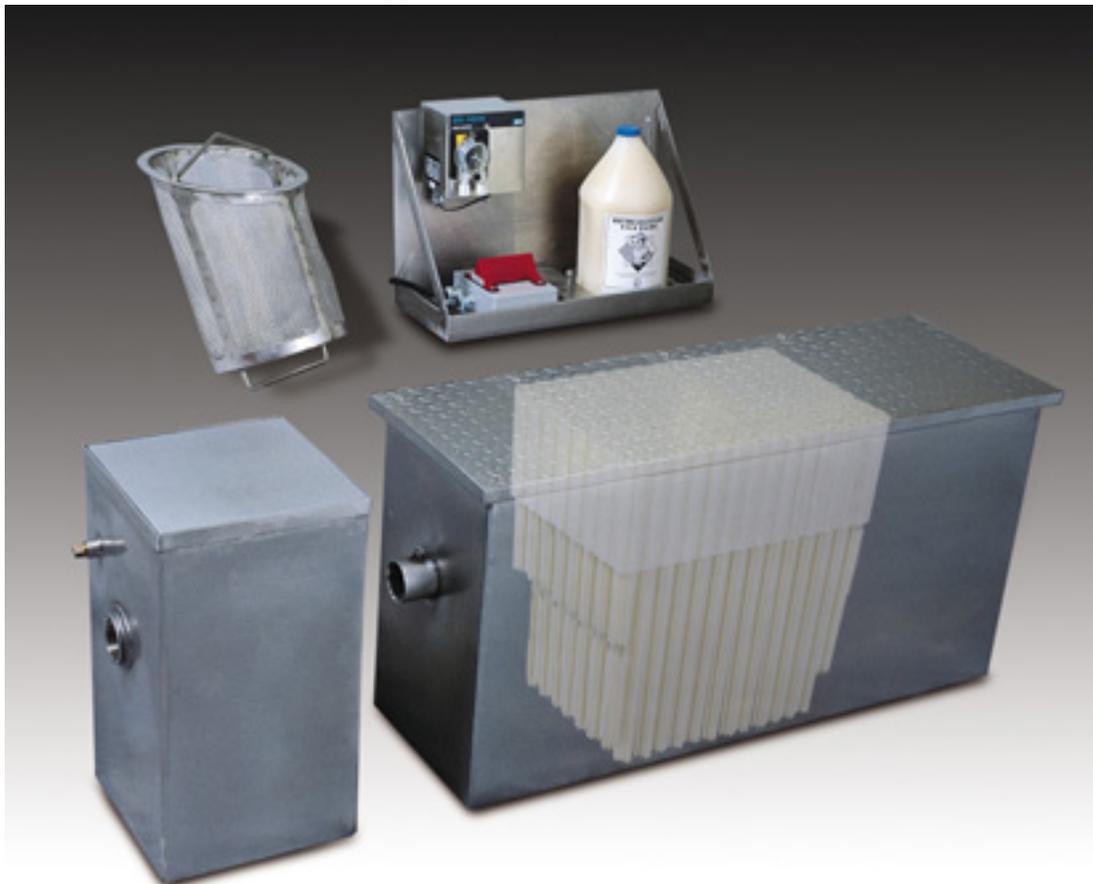


Figure 16. Typical Remediator™ System (Smith 2002)

construction. Monthly Remediator® Culture cost would be \$50. The manufacturer provided a notebook with approval/acceptance documentation from the National Evaluation Service, International Code Council, Plumbing and Drainage Institute, City of Chicago Department of Water, City of Phoenix, County Sanitation Districts of Los Angeles County, Wisconsin Department of Commerce, and Bodycote Industrial Testing. Assuming the manufacturer's claims have been confirmed, the Remediator™ has the following advantages over a passive grease interceptor.

- No grease pumping required, lowering operation and maintenance costs.
- Less expensive than replacement of inadequate grease interceptor tank.
- Limited maintenance by restaurant staff.

The following disadvantages should be noted.

- Remediator® Culture flow must be maintained according to manufacturer's specifications.
- Space is required for both the solids separator and Remediator® in the kitchen near the last FOG source, but may be installed recessed below floor level.

Additional details about the Remediator® are provided in the Appendix.

#### **4. Recommended Pretreatment for Selected Restaurant FOG Problem**

One objective of this project was to recommend a demonstration pretreatment technology for a selected restaurant in Austin, Texas. The restaurant has a seating capacity of 212 and serves meals 12 hr each day. According to the classifications shown in Figure 1, the establishment type is restaurant (60 min) and the waste flow rate is that with a dishwashing machine for commercial kitchen waste. The factors in the equation in Figure 1 lead to a grease interceptor capacity of approximately 4800 gal. According to the restaurant owner, the current grease interceptor capacity is approximately 1750 gal. According to wastewater flow metering, the average flow is 387,400 gal per month. The most recent average values of TSS, COD, and BOD<sub>5</sub> were 744, 3264, and 1852 mg/L, respectively. According to the surcharge factors in Table 1, the current monthly wastewater surcharge is almost \$2,800, or almost \$34,000 each year. The cost of a replacement grease interceptor is estimated to be over \$20,000, and quarterly evacuation would still be required. The configuration of the site will make such a replacement difficult. The owner approached the TOWTRC for help in solving the compliance problem.

Based on the alternatives identified in this project, it is recommended that the owner consider either the physical grease removal devices, such as the Big Dipper® and HT-AGI, or the combined biological and physical Remediator®. If one of the physical grease removal devices is selected, the size of the device will depend on its placement. If the grease handling is concentrated at a pre-washing rinse sink, smaller units may be sufficient. If the owner determines that all fixtures in the kitchen must be connected to the physical pretreatment device, a large capacity device will be needed. In either case, the restaurant staff will still be involved in monitoring grease accumulation and disposal of the collected grease with an appropriate grease service provider, so operation and maintenance costs will still occur. If the Remediator®, with

its solids separator, is selected, the size will also depend on the placement of the unit to serve only pre-wash rinse or all kitchen fixtures. No grease accumulation should occur, so grease handling/disposal costs will be greatly reduced, as only occasion non-grease solids removal will be needed. Operation and maintenance will include monitoring and providing the microbial culture liquid. The manufacturer claims that these operational costs will be much less than the grease evacuation costs for the grease interceptor by itself. It is interesting that the purchase prices of all of the Big Dipper®, HT-AGI, and Remediator® devices are less than the annual surcharge total for the restaurant, and are competitive with the estimated cost of grease interceptor replacement. The associated plumbing and electrical installation costs will depend on which unit is selected and where it is located within the kitchen plumbing configuration.

## 5. References

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## **Appendix**

1. HB 1979 Model Standards for a Grease Ordinance (James 2004)
2. Big Dipper® Documentation (Thermaco 2003)
3. Highland Tank HT-AGI Documentation (Highland Tank 2003)
4. Remediator® Documentation (Smith 2002)

**1. HB 1979 Model Standards for a Grease Ordinance (James 2004)**

## **2. Big Dipper® Documentation (Thermaco 2003)**

**3. Highland Tank HT-AGI Documentation (Highland Tank 2003)**

#### **4. Remediator® Documentation (Smith 2002)**

**1. HB 1979 Model Standards for a Grease Ordinance (James 2004)**

## House Bill 1979 Model Standards For a Grease Ordinance

### Section I. Applicability and Prohibitions

- (a) This ordinance shall apply to all non-domestic users of the Publicly Owned Treatment Works (POTW), as defined in Section II of this Ordinance.
- (b) Grease traps or grease interceptors shall not be required for residential users.
- (c) Facilities generating fats, oils, or greases as a result of food manufacturing, processing, preparation, or food service shall install, use, and maintain appropriate grease traps or interceptors as required in Section II of this Chapter. These facilities include but are not limited to restaurants, food manufacturers, food processors, hospitals, hotels and motels, prisons, nursing homes, and any other facility preparing, serving, or otherwise making any foodstuff available for consumption.
- (d) No user may intentionally or unintentionally allow the direct or indirect discharge of any petroleum oil, nonbiodegradable cutting oil, mineral oil, or any fats, oils, or greases of animal or vegetable origin into the POTW system in such amounts as to cause interference with the collection and treatment system, or as to cause pollutants to pass through the treatment works into the environment.

### Section II. Definitions

- (a) **Act** means Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 U.S.C. 1251, et. seq.
- (b) **BOD** means the value of the 5-day test for Biochemical Oxygen Demand, as described in the latest edition of "Standard Methods for the Examination of Water & Wastewater."
- (c) **COD** means the value of the test for Chemical Oxygen Demand, as described in the latest edition of "Standard Methods for the Examination of Water & Wastewater."
- (d) **EPA** means the United States Environmental Protection Agency.
- (e) **Fats, oils, and greases (FOG)** means organic polar compounds derived from animal and/or plant sources that contain multiple carbon chain triglyceride molecules. These substances are detectable and measurable using analytical test procedures established in 40 CFR 136, as may be amended from time to time. All are sometimes referred to herein as "grease" or "greases."
- (f) **Generator** means any person who owns or operates a grease trap/grease interceptor, or whose act or process produces a grease trap waste.
- (g) **Grease trap or interceptor** means a device designed to use differences in specific gravities to separate and retain light density liquids, waterborne fats, oils, and greases prior to the wastewater entering the sanitary sewer collection system. These devices also serve to collect settleable solids, generated by and from food preparation activities, prior to the water exiting the trap and entering the sanitary sewer collection system. Grease traps and interceptors are also referred to herein as "grease traps/interceptors."

- (h) **Grease Trap Waste** means material collected in and from an grease trap/interceptor in the sanitary sewer service line of a commercial, institutional, or industrial food service or processing establishment, including the solids resulting from de-watering processes.
- (i) **Indirect Discharge** or **Discharge** means the introduction of pollutants into a POTW from any non-domestic source.
- (j) **Interference** means a discharge which alone or in conjunction with a discharge or discharges from other sources inhibits or disrupts the POTW, its treatment processes or operations or its sludge processes, use or disposal, or is a cause of a violation of the city's TPDES permit.
- (k) **pH** means the measure of the relative acidity or alkalinity of water and is defined as the negative logarithm (base 10) of the hydrogen ion concentration.
- (l) **POTW or Publicly Owned Treatment Works** means a treatment works which is owned by a state or municipality as defined by section 502(4) of the Clean Water Act. This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes all sewers, pipes and other conveyances that convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in section 502(4) of the Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works. For purposes of this ordinance, the terms "sanitary sewer system" and "POTW" may be used interchangeably.
- (m) **TCEQ** means the Texas Commission on Environmental Quality, and its predecessor and successor agencies.
- (n) **Transporter** means a person who is registered with and authorized by the TCEQ to transport sewage sludge, water treatment sludge, domestic septage, chemical toilet waste, grit trap waste, or grease trap waste in accordance with 30 TEXAS ADMINISTRATIVE CODE §312.142.
- (o) **TSS** means the value of the test for Total Suspended Solids, as described in the latest edition of "Standard Methods for the Examination of Water & Wastewater."
- (p) **User** means any person, including those located outside the jurisdictional limits of the city, who contributes, causes or permits the contribution or discharge of wastewater into the POTW, including persons who contribute such wastewater from mobile sources.

### **Section III. Installation and Maintenance Requirements**

- (a) Installations
  - 1) **New Facilities.** Food processing or food service facilities which are newly proposed or constructed, or existing facilities which will be expanded or renovated to include a food service facility, where such facility did not previously exist, shall be required to design, install, operate and maintain a grease trap/interceptor in accordance with locally adopted plumbing codes or other applicable ordinances. Grease traps/interceptors shall be installed and inspected prior to issuance of a certificate of occupancy.

- 2) Existing Facilities. Existing grease traps/interceptors must be operated and maintained in accordance with the manufacturer's recommendations and in accordance with these Model Standards, unless specified in writing and approved by the POTW.
  - 3) All grease trap/interceptor waste shall be properly disposed of at a facility in accordance with federal, state, or local regulation.
- (b) Cleaning and Maintenance
- 1) Grease traps and grease interceptors shall be maintained in an efficient operating condition at all times.
  - 2) Each grease trap pumped shall be fully evacuated unless the trap volume is greater than the tank capacity on the vacuum truck in which case the transporter shall arrange for additional transportation capacity so that the trap is fully evacuated within a 24-hour period, in accordance with 30 TEXAS ADMINISTRATIVE CODE §312.143.
- (c) Self-Cleaning
- 1) Grease trap self-cleaning operators must receive approval from the POTW annually prior to removing grease from their own grease trap(s) located inside a building, provided:
    - (A) the grease trap is no more than fifty (50) gallons in liquid/operating capacity;
    - (B) proper on-site material disposal methods are implemented (e.g. absorb liquids into solid form and dispose into trash);
    - (C) the local solid waste authority allows such practices;
    - (D) grease trap waste is placed in a leak proof, sealable container(s) located on the premises and in an area for the transporter to pump-out; and
    - (E) detailed records on these activities are maintained.
  - 2) Grease trap self-cleaning operators must submit a completed self-cleaning request to the POTW for approval. The written request shall include the following information:
    - (A) Business name and street address;
    - (B) Grease trap/interceptor operator name, title, and phone number;
    - (C) Description of maintenance frequency, method of disposal, method of cleaning and size (in gallons) of the grease trap/interceptor; and
    - (D) Signed statement that the operator will maintain records of waste disposal and produce them for compliance inspections.

- 3) Self-cleaners must adhere to all the requirements; procedures and detailed record keeping outlined in their approved application, to ensure compliance with this ordinance. A maintenance log shall be kept by self-cleaning operators that indicates, at a minimum, the following information:
  - (A) Date the grease trap/interceptor was serviced;
  - (B) Name of the person or company servicing the grease trap/interceptor;
  - (C) Waste disposal method used;
  - (D) Gallons of grease removed and disposed of;
  - (E) Waste oil added to grease trap/interceptor waste; and
  - (F) Signature of the operator after each cleaning that certifies that all grease was removed, disposed of properly, grease trap/interceptor was thoroughly cleaned, and that all parts were replaced and in operable condition.
- 4) Violations incurred by grease trap self-cleaners will be subject to enforcement action including fines and/or removal from the self-cleaner program.

(d) Cleaning Schedules

- 1) Grease traps and grease interceptors shall be cleaned as often as necessary to ensure that sediment and floating materials do not accumulate to impair the efficiency of the grease trap/interceptor; to ensure the discharge is in compliance with local discharge limits; and to ensure no visible grease is observed in discharge.
- 2) Grease traps and grease interceptors subject to these standards shall be completely evacuated a minimum of every ninety (90) days, or more frequently when:
  - (A) twenty-five (25) percent or more of the wetted height of the grease trap or grease interceptor, as measured from the bottom of the device to the invert of the outlet pipe, contains floating materials, sediment, oils or greases; or
  - (B) the discharge exceeds BOD, COD, TSS, FOG, pH, or other pollutant levels established by the POTW; or
  - (C) if there is a history of non-compliance.
- 3) Any person who owns or operates a grease trap/interceptor may submit to the POTW a request in writing for an exception to the ninety (90) day pumping frequency of their grease trap/interceptor. The POTW may grant an extension for required cleaning frequency on a case-by-case basis when:
  - (A) the grease trap/interceptor owner/operator has demonstrated the specific trap/interceptor will produce an effluent, based on defensible analytical results, in consistent compliance with established local discharge limits such as BOD, TSS, FOG, or other parameters as determined by the POTW, or

- (B) less than twenty-five (25) percent of the wetted height of the grease trap or grease interceptor, as measured from the bottom of the device to the invert of the outlet pipe, contains floating materials, sediment, oils or greases
  - 4) In any event, a grease trap and grease interceptor shall be fully evacuated, cleaned, and inspected at least once every 180 days.
- (e) Manifest Requirements
- 1) Each pump-out of a grease trap or interceptor must be accompanied by a manifest to be used for record keeping purposes.
  - 2) Persons who generate, collect and transport grease waste shall maintain a record of each individual collection and deposit. Such records shall be in the form of a manifest. The manifest shall include:
    - (A) name, address, telephone, and commission registration number of transporter;
    - (B) name, signature, address, and phone number of the person who generated the waste and the date collected;
    - (C) type and amount(s) of waste collected or transported;
    - (D) name and signature(s) of responsible person(s) collecting, transporting, and depositing the waste;
    - (E) date and place where the waste was deposited;
    - (F) identification (permit or site registration number, location, and operator) of the facility where the waste was deposited;
    - (G) name and signature of facility on-site representative acknowledging receipt of the waste and the amount of waste received;
    - (H) the volume of the grease waste received; and
    - (I) a consecutive numerical tracking number to assist transporters, waste generators, and regulating authorities in tracking the volume of grease transported.
  - 3) Manifests shall be divided into five parts and records shall be maintained as follows.
    - (A) One part of the manifest shall have the generator and transporter information completed and be given to the generator at the time of waste pickup.

- (B) The remaining four parts of the manifest shall have all required information completely filled out and signed by the appropriate party before distribution of the manifest.
  - (C) One part of the manifest shall go to the receiving facility.
  - (D) One part shall go to the transporter, who shall retain a copy of all manifests showing the collection and disposition of waste.
  - (E) One copy of the manifest shall be returned by the transporter to the person who generated the wastes within 15 days after the waste is received at the disposal or processing facility.
  - (F) One part of the manifest shall go to the local authority.
- 4) Copies of manifests returned to the waste generator shall be retained for five years and be readily available for review by the POTW.
- (f) Alternative Treatment
- 1) A person commits an offense if the person introduces, or causes, permits, or suffers the introduction of any surfactant, solvent or emulsifier into a grease trap. Surfactants, solvents, and emulsifiers are materials which allow the grease to pass from the trap into the collection system, and include but are not limited to enzymes, soap, diesel, kerosene, terpene, and other solvents.
  - 2) It is an affirmative defense to an enforcement of Section III. ( f) (1) that the use of surfactants or soaps is incidental to normal kitchen hygiene operations.
  - 3) Bioremediation media may be used with the POTW's approval if the person has proved to the satisfaction of the POTW that laboratory testing which is appropriate for the type of grease trap to be used has verified that:
    - (A) The media is a pure live bacterial product which is not inactivated by the use of domestic or commercial disinfectants and detergents, strong alkalis, acids, and/or water temperatures of 160°F (71°C).
    - (B) The use of the media does not reduce the buoyancy of the grease layer in the grease trap and does not increase the potential for oil and grease to be discharged to the sanitary sewer.
    - (C) The use of the bioremediation media does not cause foaming in the sanitary sewer.
    - (D) The BOD, COD, and TSS discharged to the sanitary sewer after use of the media does not exceed the BOD, COD, and TSS which would be discharged if the product were not being used and the grease trap was being properly maintained. pH levels must be between 5 and 11.

- 4) All testing designed to satisfy the criteria set forth in Section III (f) (3) shall be scientifically sound and statistically valid. All tests to determine oil and grease, TSS, BOD, COD, pH, and other pollutant levels shall use appropriate tests which have been approved by the Environmental Protection Agency and the Texas Commission on Environmental Quality and which are defined in Title 40, Code of Federal Regulations, Part 136 or Title 30, TEXAS ADMINISTRATIVE CODE §319.11. Testing shall be open to inspection by the POTW, and shall meet the POTW's approval.

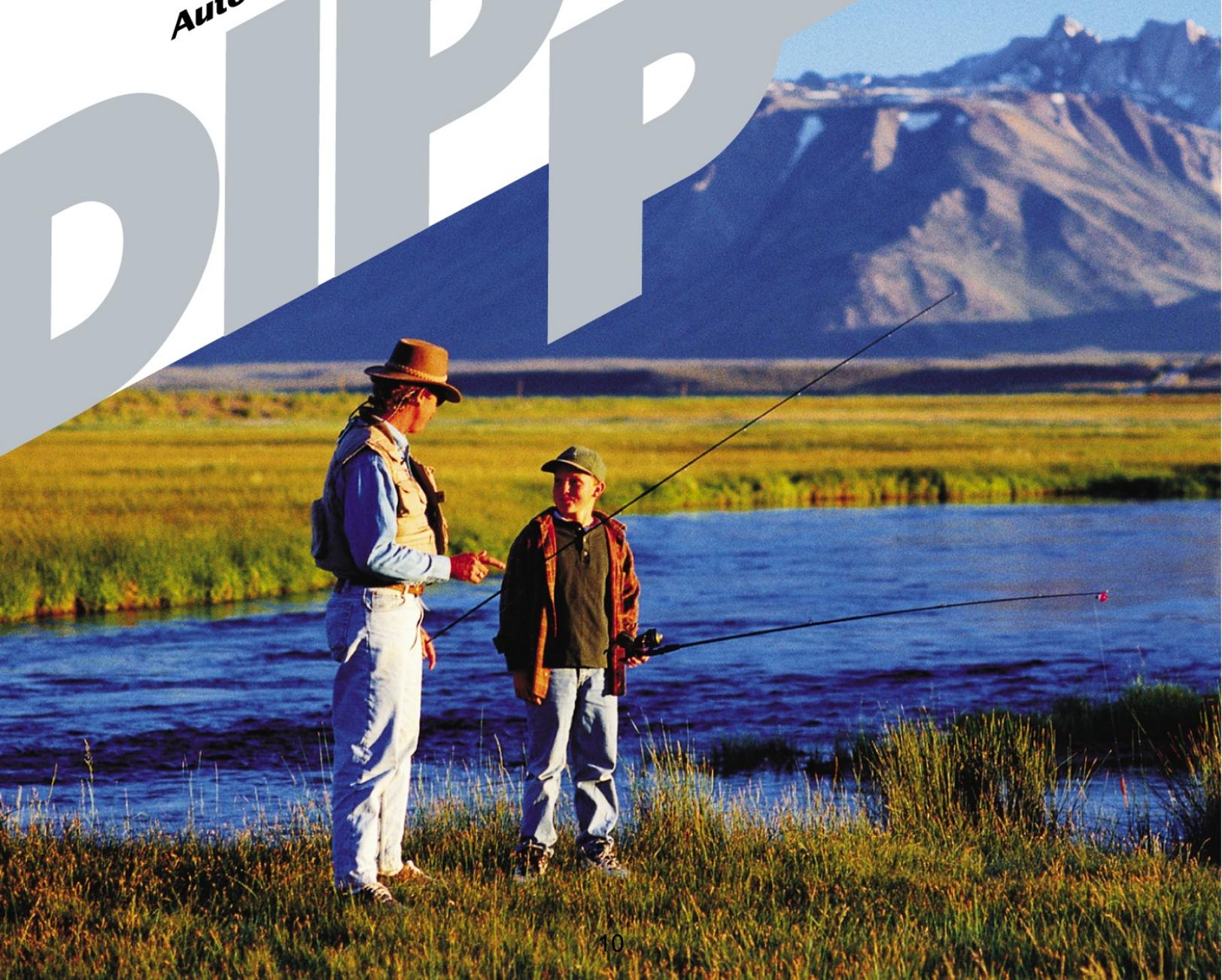
#### **Section IV. Schedule of Penalties**

- (a) If the POTW determines that a generator is responsible for a blockage of a collection system line the generator shall owe a civil penalty of \$1,000 for the first violation, \$1,500 for a second violation, and \$2,000 for the third violation within a two-year period. Continuous violations shall result in an increase in penalty by \$500 and may also result in termination of services.
- (b) Any person violating any of the provisions of this Ordinance shall be subject to a written warning for the first violation, a \$1,000 civil penalty for the second violation, a \$1,500 civil penalty for the third violation, and a \$2,000 civil penalty for the fourth violation within a two- year period. Consistent violations will result in a \$500 increase in civil penalty and may result in termination of service.

## **2. Big Dipper® Documentation (Thermaco 2003)**

**Thermaco**  
**BIG DIPPER**<sup>®</sup>  
Kitchen Grease and Solids Removal Systems  
For a Cleaner, Safer Environment  
Automatic Grease and Oil Removal Units

**DIPPER**<sup>®</sup>



# Who needs BIG DIPPER®?



Are you planning to build a Foodservice Facility or renovate an old one? A **Big Dipper®** grease and oils removal system will help you avoid expensive business interruptions and higher operating costs while meeting plumbing/building requirements.

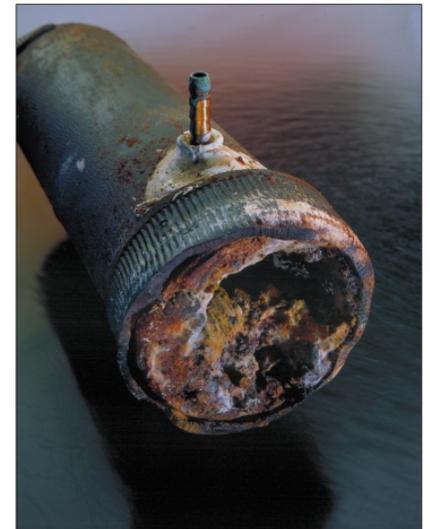
### Here's how

An affordable Big Dipper® system solves tough drainwater problems by removing and recovering nearly 100% of the grease, oils, fats and coarse solids from kitchen and food processing flows. Big Dipper® products help prevent drain line clogging and protect septic fields and on-site treatment facilities. Big Dipper® systems are designed to eliminate grease trap pumping costs and expensive sewer surcharges while saving the cost of large in-ground grease traps or interceptors. Big Dipper® systems have been performance-proven in hundreds of worldwide restaurants, hospitals, schools, prisons, casinos and food-processing plants.

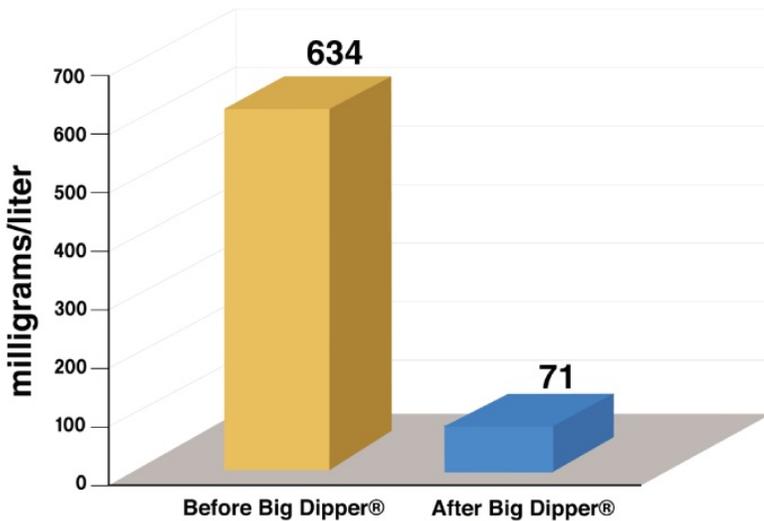
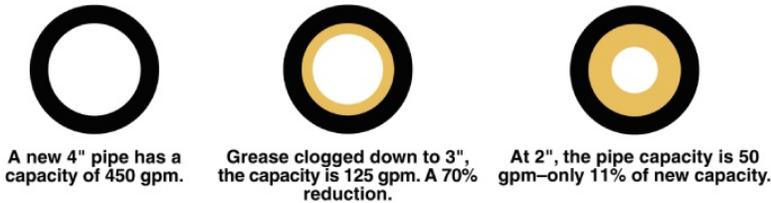
### Does this look familiar?

This section of pipe was removed from a major fast food restaurant in a large metropolitan city before they installed a Big Dipper® unit. A large, precast concrete grease trap had previously serviced the

restaurant. The copper nipple at the top had been an attempt to clear grease congestion using enzymes and bacteria. The restaurant had been using these enzymes and bacteria for nearly eight years. You can see the results yourself! If you are having problems with grease clogging your pipes, Big Dipper® presents a clear solution.



### Pipe Failure Cycle



**Grease levels before and after installation of a Big Dipper® Unit**

Big Dipper® systems are designed for easy field upgrading and a range of options enable installations to be customized to meet various conditions. For example, air-gap kits are available in code-required areas. Solids strainers are available to filter food scraps and other solids from kitchen drain flows. Your Big Dipper® affiliate can assist you with choosing options to fit your application.

### Performance

The most important characteristic about Big Dipper® Removal Systems is that they work. There are countless success stories. One nationally known fast food facility cut grease trap pumping costs by over \$25,000. A large hospital in the Northeast saved an estimated \$50,000 a year in fines and maintenance costs by installing a Big Dipper®.

Big Dipper® systems solved a huge grease problem at two Puerto Rican prisons and weekly removes more than 100 gallons of grease from each prison. Furthermore, in most applications, the recovered grease can be recycled.

## How do you choose the right product to solve your problem?



### Satisfying the Inspector

Many local plumbing codes require large in-ground grease traps. Approximately 30% of existing foodservice sites cannot install large in-ground traps because of space restrictions or excessive site construction costs(\$10,000-\$45,000)!

With thousands of systems installed in the field worldwide, Thermaco, Inc. is the number one manufacturer of automatic grease & oil removal units. Featuring a small footprint, Big Dipper systems are the logical solution for space-constrained installations in tight kitchens. Big Dippers also work well in metropolitan and heavily developed settings, where exterior space for installing a large, in-ground trap is limited or non-existent.

### Satisfying the Sewer Authority

Grease that collects in sewers and treatment plants is a problem shared by all wastewater treatment and collection system operators. In the past, engineers and operators

designed systems to remove grease after it got to the plant. In the meantime; however, the grease would clog pipes, create large grease balls, and damage equipment like lift stations.

Today, wastewater treatment plant operators are lowering operating costs and making their plants significantly more efficient by eliminating grease before it reaches the plant. Requiring system users to install automatic grease removal units accomplishes this.

### Reliability and Maintenance

The Big Dipper® line has an international reputation for reliability and effectiveness in wastewater pretreatment. Constructed of heavy stainless steel, the systems are engineered for long-life service and low maintenance.



### Customer Service and Assurance

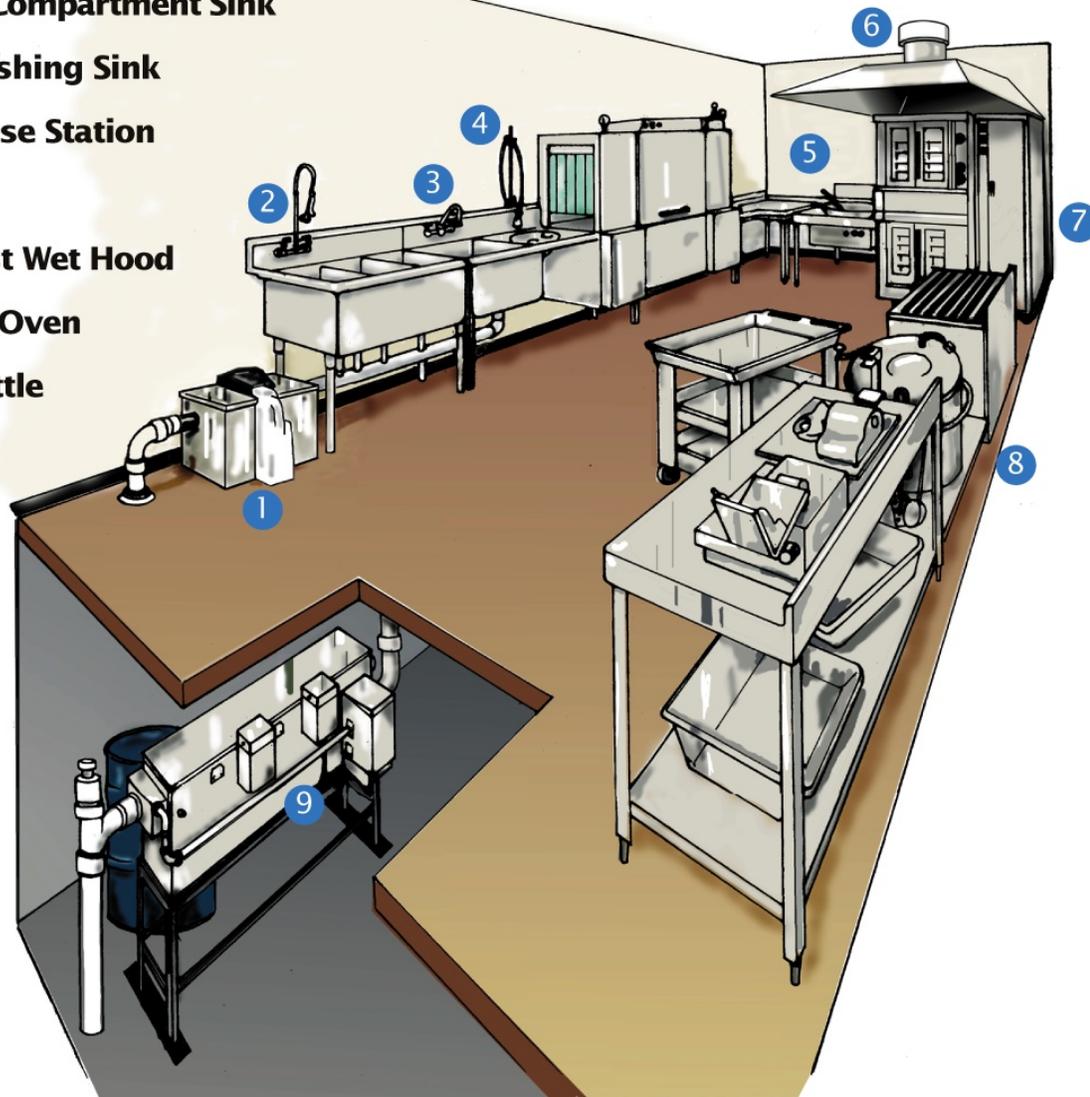
Customer service and dedication to quality does not end with the sale. Experienced management and field sales affiliates are available to help customers with special needs. Big Dipper® products are backed by years of testing and in-service refinement. Of all the systems installed throughout the world in the past two decades, over 95% are still operating efficiently every day. This is quality you can trust.

### Commitment

Big Dipper is committed to total customer satisfaction. We are dedicated to the continuous improvement of our products through uncompromising attention to quality in both design and workmanship. Our drive to do the best job possible has been demonstrated in the evolution of our products and methods.

## Most Effective Sites in a Kitchen

- ② Three Compartment Sink
- ③ Pot Washing Sink
- ④ Pre-Rinse Station
- ⑤ Wok
- ⑥ Exhaust Wet Hood
- ⑦ Combi-Oven
- ⑧ Tilt Kettle



### POINT-SOURCE GREASE REMOVAL

Smaller installations such as fast food restaurants, schools, or cafeterias usually require point-source removal units. ① These will be installed directly at the source, usually at a three-compartment sink or a pot-washing sink. These units easily fit under a counter at the three-compartment sink or pre-rinse station in the kitchen operation. Point-source grease removal units include the W-200-IS (20 GPM) through W-500-IS (50 GPM) and W-300-AST (30 GPM) Big Dipper systems.

### CENTRAL GREASE REMOVAL

Some installations require the removal of grease & oils from a centralized location with kitchen effluent flows coming in from several different sources. ⑨ These include sites such as hospitals, correctional facilities and casinos - any site that has a large, institutional-type kitchen. The larger units in the Big Dipper® equipment line are best suited for these installations. These units are easily located in a basement or equipment room site. Central grease removal units include the W-500-AST (50 GPM) through W-1000-AST (100 GPM) Big Dipper systems. Systems servicing higher GPM capacities are also available.

## BIG DIPPER® Product Applications

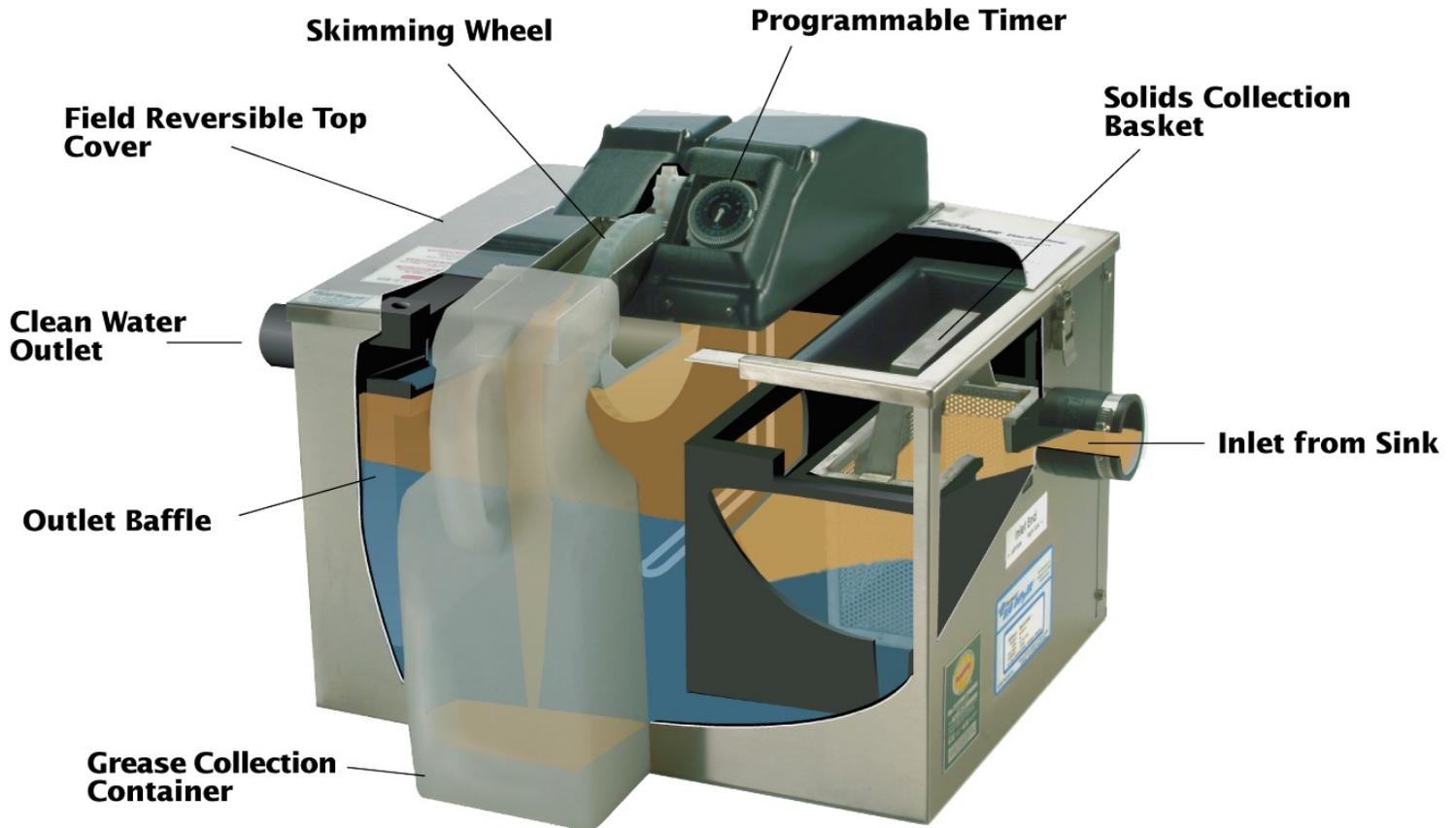
**Restaurants**  
**Shopping Centers**  
**Cafeterias**  
**Schools**

**Hospitals**  
**Correctional**  
**Facilities**  
**Casinos**

**Resorts**  
**Airports**  
**Grocery Stores**

## BIG DIPPER® IS Unit Operation

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Cutaway Drawing of Big Dipper® W-200-IS

## BIG DIPPER® Product Features and Benefits

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- **Big Dipper units separate fats, oils and grease with a proven efficiency of up to 98.6%. Automatic removal of grease retains unit separation efficiency.**
- **Fully automatic self cleaning cycle with 24-hour programmable timer. Removes collected grease & oils from tank without any operator assistance.**
- **Constructed of corrosion resistant materials. Suitable for installation in virtually any location.**
- **Integrated Motor/Grease Outlet/Heater/Lid on the IS Series. Enables fast, do-it-yourself unit operation reversal.**
- **Incidental solids automatically removed in AST Series. No strainer basket to manually empty.**
- **Easy lift grease collector in the IS Series. Simplifies grease collection container emptying.**
- **Compact footprint. Makes installation possible in tight spaces.**

## BIG DIPPER® IS Units

Big Dipper Internal Strainer (IS) series units utilize an internal strainer basket to capture incidental solids in kitchen wastewater flows. A skimming wheel system inside the unit skims the grease & oils out of the retention area when activated by an integral programmable timer. IS units work well inside fast food-type restaurants or food preparation facilities where grease removal directly at the source is paramount. Big Dipper IS unit sizes handle kitchen flows of 20 to 50 gallons per minute.

### Point Source Grease Removal Units

Units in the 20-30 GPM (1.26-3.15 l/s) range typically service a single fixture such as a pot sink or pre-rinse station and are installed as close as possible to the device being serviced.

#### W-200-IS 20 GPM (1.26 l/s)

Exterior Construction: 304 Stainless Steel, Bright Finish  
Skimming Rate: 35 lb./hr. (15.9 kg/hr)  
Solids Strainer Capacity: 1.16 gallons (4.4 l)  
2" Inlet/Outlet (50 mm)  
350W/115V/60Hz\*

#### W-250-IS 25 GPM (1.58 l/s)

Exterior Construction: 304 Stainless Steel, Bright Finish  
Skimming Rate: 35 lb./hr. (15.9 kg/hr)  
Solids Strainer Capacity: 1.16 gallons (4.4 l)  
2" Inlet/Outlet (50 mm)  
350W/115V/60Hz\*

#### W-350-IS 35 GPM (2.21 l/s)

Exterior Construction: 304 Stainless Steel, Bright Finish  
Skimming Rate: 35 lb./hr. (15.9 kg/hr)  
Solids Strainer Capacity: 2.5 gallons (9.5 l)  
3" Inlet/Outlet (75 mm)  
350W/115V/60Hz\*

#### W-500-IS 50 GPM (3.15 l/s)

Exterior Construction: 304 Stainless Steel, Bright Finish  
Skimming Rate: 35 lb./hr. (15.9 kg/hr)  
Solids Strainer Capacity: 2.5 gallons (9.5 l)  
3" Inlet/Outlet (75 mm)  
350W/115V/60Hz\*

#### W-300-AST 30 GPM (1.89 l/s)

Exterior Construction: 304 Stainless Steel, Bright Finish  
Skimming Rate: 52.5 lb./hr. (23.9 kg/hr)  
Automatic Solids Transfer Feature\*\*  
3" Inlet/Outlet (75 mm)  
1500W/115V/60Hz\*



**BIG DIPPER® W-200-IS**

\*220-240V/50hz models available

\*\*Big Dipper Model W-300-AST requires a separate facility-supplied 5 GPM (.315 l/s) water supply for operation. Thermaco, Inc. provides a 0.5" (13 mm) male connector to accommodate this connection. Minimum water supply pressure should be 40 PSI (2.76 Bar); maximum water supply pressure should be 70 PSI (4.83 Bar).

**Note: Installations must comply with all applicable local, state and national codes for your area.**

## BIG DIPPER® AST Units

Big Dipper Automatic Solids Transfer (AST) series units provide full automatic grease removal and solids handling. Incidental solids are strained out of the kitchen wastewater and trapped in the solids chamber. Periodically, a water-driven eductor automatically empties the incidental solids out of the solids chamber. Like the IS series, the AST series has a skimming wheel system inside the unit which skims the grease & oils out of the retention area when activated by an integral timer. AST models treat kitchen wastewater flows of 30 through 100 gallons per minute. These systems are geared towards larger facilities like hospitals, correctional facilities or casinos, where grease removal from a central location is important.

### Centralized Grease Removal Units

These units are suited for high-flow applications and those applications where multiple fixtures are being serviced. Units in the 50 to 150 GPM (3.15-8.46 l/s) range are also frequently necessary for basement or locations where significant head pressure is present.

#### W-500-AST 50 GPM (3.15 l/s)

Exterior Construction: 304 Stainless Steel, Bright Finish  
Skimming Rate: 52.5 lb./hr. (23.9 kg/hr)  
Automatic Solids Transfer Feature\*\*  
4" Inlet/Outlet (100 mm)  
1500W/115V/60Hz\*

#### W-750-AST 75 GPM (4.73 l/s)

Exterior Construction: 304 Stainless Steel, Bright Finish  
Skimming Rate: 138 lb./hr. (62.7 kg/hr)  
Automatic Solids Transfer Feature\*\*  
4" Inlet/Outlet (100 mm)  
3000W/208-240V/60Hz\*

#### W-1000-AST 100 GPM (6.31 l/s)

Exterior Construction: 304 Stainless Steel, Bright Finish  
Skimming Rate: 138 lb./hr. (62.7 kg/hr)  
Automatic Solids Transfer Feature\*\*  
4" Inlet/Outlet (100 mm)  
3000W/208-240V/60Hz\*



**BIG DIPPER® W-300-AST**

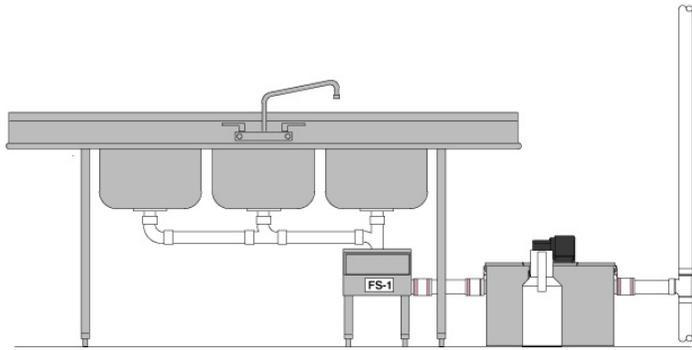


**BIG DIPPER® W-750-AST**

\*220-240V/50hz models available

\*\*Big Dipper Models W-500-AST through W-1000-AST models require a separate facility-supplied 5 GPM (.315 l/s) water supply for operation. Thermaco, Inc. provides a 0.5" (13 mm) male connector to accommodate this connection. Minimum water supply pressure should be 40 PSI (2.76 Bar); maximum water supply pressure should be 70 PSI (4.83 Bar).

**Note: Installations must comply with all applicable local, state and national codes for your area.**

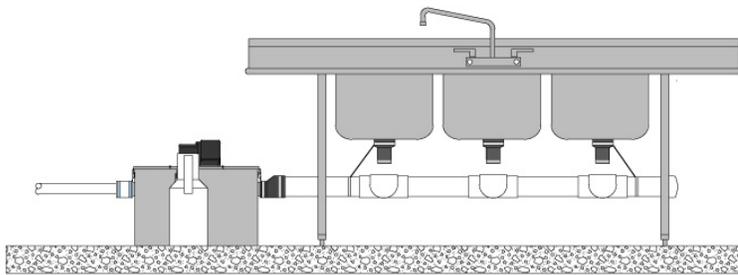


**FS-1 Flat Strainer Servicing a Pre-Rinse Station**

## FS-1 Flat Strainer

An effective non-mechanical replacement for a garbage disposal. The Flat Strainer separates coarse solids such as rice, slaw and other similar foodstuffs for easy removal. Popular for servicing pre-rinse sinks at the dishwashing station.

- **Stainless Steel Construction**
- **Field-Modifiable Polycarbonate Lid Cover**
- **Adjustable Height**
- **Removable Tray**



**AGK Air Gap Kit servicing a Three Compartment Sink**

Patent Pending

## AGK Series Air Gap Kits

The AGK Air Gap Assembly offers a simple yet effective method for providing an air gap for meeting health department or plumbing code requirements.

- **Available in PVC or Copper.**



**BIG DIPPER® IS**



**BIG DIPPER® AST**



\* Please consult Thermaco, Inc. for specific models tested, certified and/or listed by these organizations.

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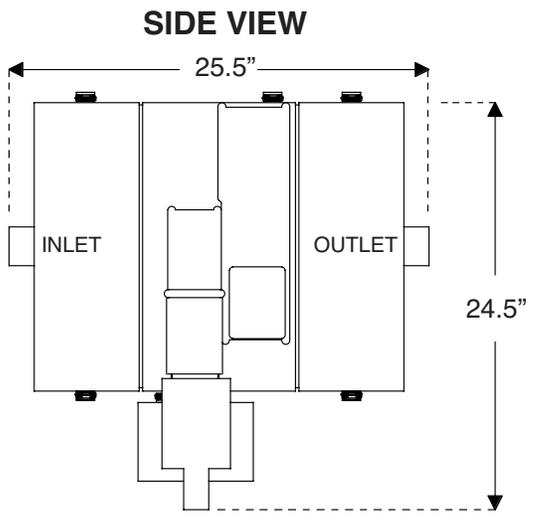
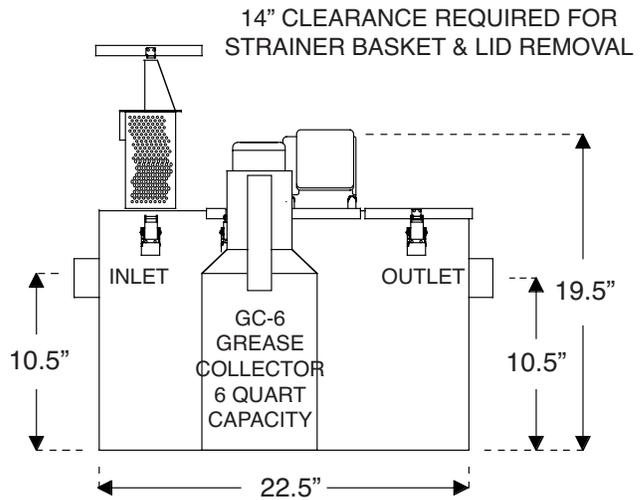
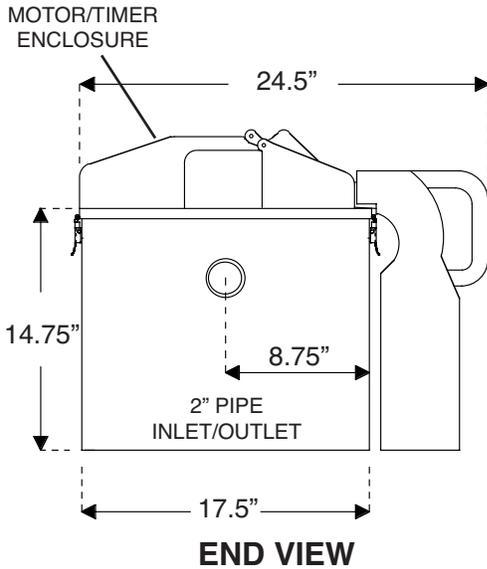
Big Dipper® products are covered by U.S. and International patents and patents pending.

Thermaco, Inc. · P.O. Box 2548 · Asheboro, NC · 27203-2548  
 e-mail: [info@thermaco.com](mailto:info@thermaco.com) · Online: [www.big-dipper.com](http://www.big-dipper.com)  
 Phone: (336) 629-4651 · Fax: (336) 626-5739 · Toll Free: (800) 633-4204



# Big Dipper® Point Source Automatic Grease Removal Systems

## W-200-IS Specifications



### FEATURES:

- Fully automatic self cleaning cycle. Removes collected grease & oils from tank without any operator assistance. Comes complete with 24-hour timer.
- Constructed of corrosion resistant materials suitable for installation in virtually any location. Attractive sanitary Stainless Steel exterior.
- Integrated Motor/Grease Outlet/Heater/Lid enables a fast, do-it-yourself unit operation reversal.
- Easy lift grease collector simplifies grease collection container emptying.
- Compact footprint.

TECHNICAL DATA	
Materials:	Exterior: 304 Stainless Steel, Bright Finish Interior: Rotationally Molded Polyethylene
Electrical:	115 VAC, 60 Hz, 350 Watts (3 Amps)
Maximum Inlet Flow Rate:	20 GPM
Number of Skimming Wheels:	1
Skimming Rate:	35 Pounds Per Hour
Grease Retention Capacity:	40+ Pounds
Internal Solids Strainer Capacity:	1.16 Gallons



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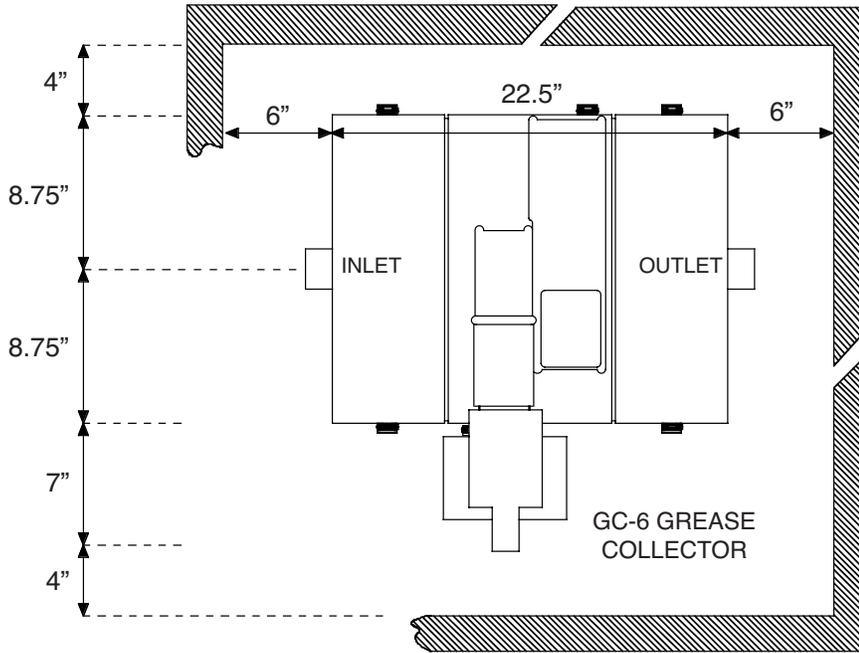


**Big Dipper® Point Source Automatic Grease Removal Systems**

**W-200-IS Specifications**

**INSTALLATION INFORMATION**

**Suggested Minimum Footprint Dimensions**



**DO . . .**

Allow a minimum of 14" clearance for removal of unit lid.

READ instruction manual included with system before doing anything.

Install unit allowing for the minimum clearances shown.

Make sure the height above the Internal Strainer Access Cover is enough to remove the strainer.

Make piping connections with rubber "No Hub" connectors.

Keep outlet piping as straight as possible. Use only "sweep" connections.

Install vent on outlet piping.

Fill the tank with water before energizing the power to the motor and heater.

Set Programmable Time Controller for proper operating times.

**DON'T . . .**

Install "P" trap on outlet connection of tank. (Note: the unit already has an internal gas trap). Reduce pipe size on outlet piping.

**Note:**

Installations must comply with all applicable local, state, and national codes for your area.

**Job Specification:**

Grease and oils separator(s) shall be Thermaco **Big Dipper** automatic grease/oil recovery system(s) as manufactured by Thermaco, Inc., Asheboro, North Carolina as noted on plans.

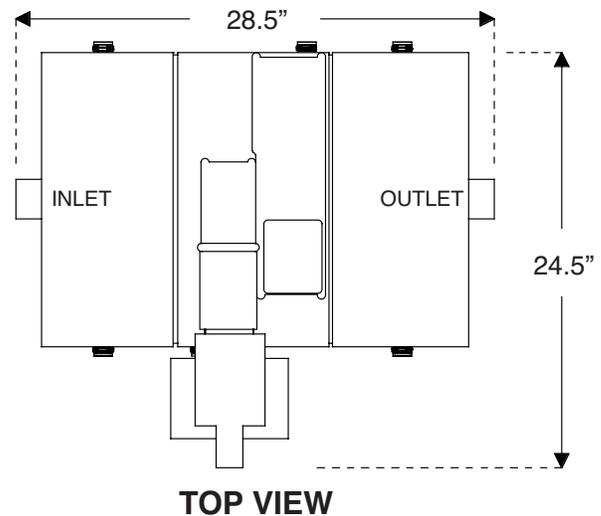
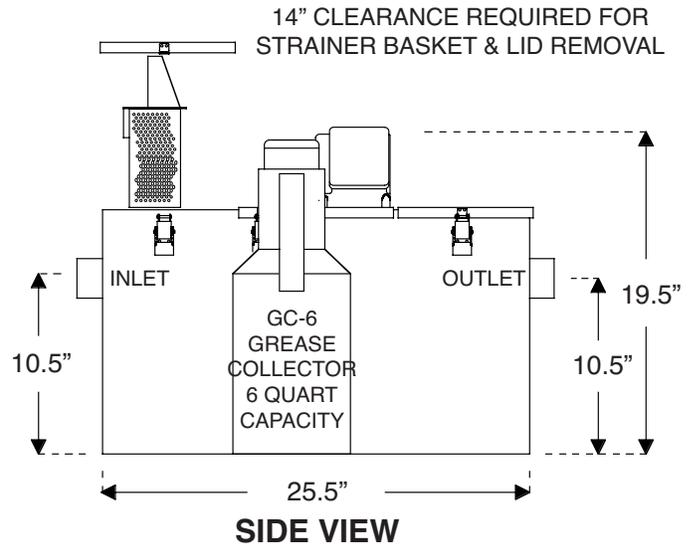
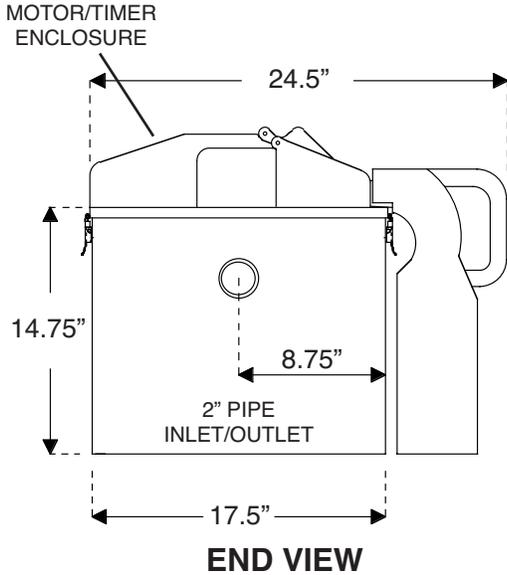
**Separator Specifications:**

Furnish and install \_\_\_ Thermaco **Big Dipper** Model No. W-200-IS, bright finish type 304 stainless steel exterior, rotationally molded polyethylene interior automatic self-cleaning grease and oil recovery separator(s) for floor mounted or partially recessed installation, rated at 20 gallons per minute peak flow, 40 pounds of grease capacity and including as an integral part of the unit, 1 rotating gear hydrophobic wheel assembly for automatic grease/oil removal, an integral flow control device, self-regulating enclosed electric immersion heater, a vessel vent, an integral gas trap, an integral programmable 24-hour multi-event time control, a field reversible motor location, a field reversible grease/oil sump outlet, quick release stainless steel lid clamps, a gasketed and fully removable 304 stainless steel lid, a hinged lift-out strainer basket access, an internal stainless steel strainer basket for collection of coarse solids, and a separate grease and oils collection container. Electric assembly shall be tested to comply with pertinent sections of the Standards for Safety ANSI/UL 73 and/or ANSI/UL 1004. Electric motor shall be equipped with thermal overload protection with automatically resettable switch.



# Big Dipper® Point Source Automatic Grease Removal Systems

## W-250-IS Specifications



### FEATURES:

- Fully automatic self cleaning cycle. Removes collected grease & oils from tank without any operator assistance. Comes complete with 24-hour timer.
- Constructed of corrosion resistant materials suitable for installation in virtually any location. Attractive sanitary Stainless Steel exterior.
- Integrated Motor/Grease Outlet/Heater/Lid enables a fast, do-it-yourself unit operation reversal.
- Easy lift grease collector simplifies grease collection container emptying.
- Compact footprint.

### TECHNICAL DATA

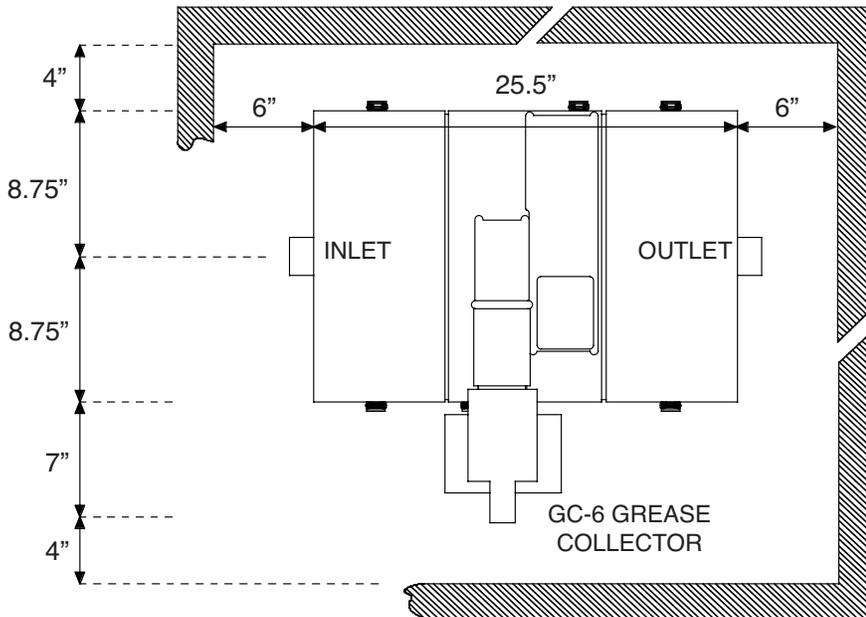
Materials: _____	Exterior: 304 Stainless Steel, Bright Finish
	Interior: Rotationally Molded Polyethylene
Electrical: _____	115 VAC, 60 Hz, 350 Watts (3 Amps)
Maximum Inlet Flow Rate: _____	25 GPM
Number of Skimming Wheels: _____	1
Skimming Rate: _____	35 Pounds Per Hour
Grease Retention Capacity: _____	50+ Pounds
Internal Solids Strainer Capacity: _____	1.16 Gallons



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**INSTALLATION INFORMATION**

**Suggested Minimum Footprint Dimensions**



**DO . . .**

Allow a minimum of 14" clearance for removal of unit lid.

READ instruction manual included with system before doing anything.

Install unit allowing for the minimum clearances shown.

Make sure the height above the Internal Strainer Access Cover is enough to remove the strainer.

Make piping connections with rubber "No Hub" connectors.

Keep outlet piping as straight as possible. Use only "sweep" connections.

Install vent on outlet piping.

Fill the tank with water before energizing the power to the motor and heater.

Set Programmable Time Controller for proper operating times.

**DON'T . . .**

Install "P" trap on outlet connection of tank. (Note: the unit already has an internal gas trap). Reduce pipe size on outlet piping.

**Note:**

Installations must comply with all applicable local, state, and national codes for your area.

**Job Specification:**

Grease and oils separator(s) shall be Thermaco **Big Dipper** automatic grease/oil recovery system(s) as manufactured by Thermaco, Inc., Asheboro, North Carolina as noted on plans.

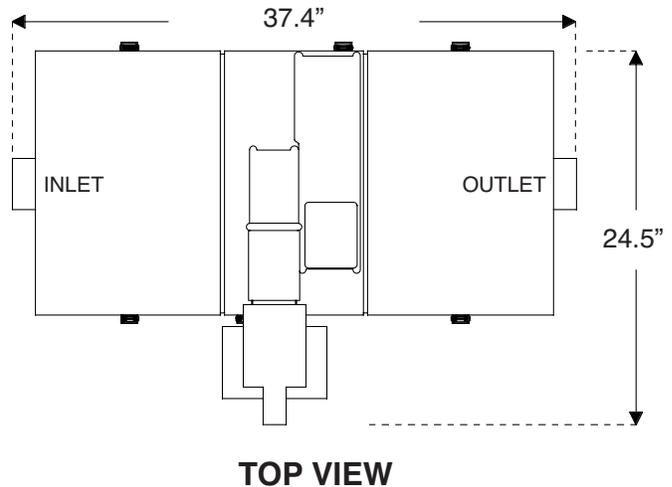
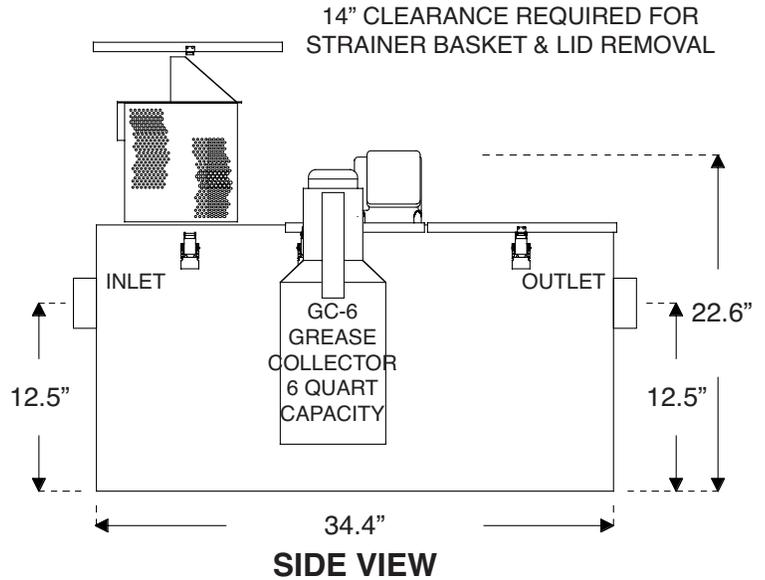
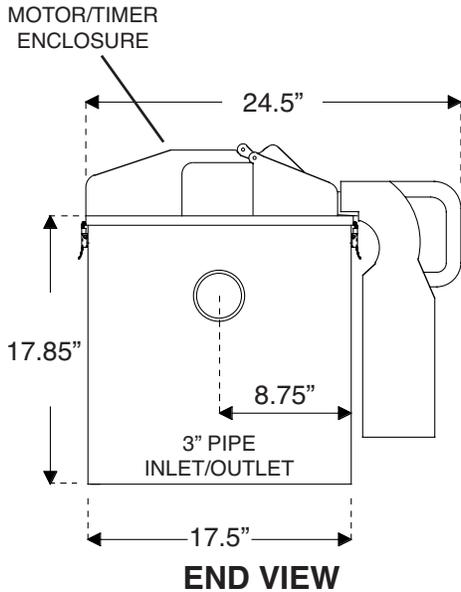
**Separator Specifications:**

Furnish and install \_\_\_ Thermaco **Big Dipper** Model No. W-250-IS, bright finish type 304 stainless steel exterior, rotationally molded polyethylene interior automatic self-cleaning grease and oil recovery separator(s) for floor mounted or partially recessed installation, rated at 25 gallons per minute peak flow, 50 pounds of grease capacity and including as an integral part of the unit, 1 rotating gear hydrophobic wheel assembly for automatic grease/oil removal, an integral flow control device, self-regulating enclosed electric immersion heater, a vessel vent, an integral gas trap, an integral programmable 24-hour multi-event time control, a field reversible motor location, a field reversible grease/oil sump outlet, quick release stainless steel lid clamps, a gasketed and fully removable 304 stainless steel lid, a hinged lift-out strainer basket access, an internal stainless steel strainer basket for collection of coarse solids, and a separate grease and oils collection container. Electric assembly shall be tested to comply with pertinent sections of the Standards for Safety ANSI/UL 73 and/or ANSI/UL 1004. Electric motor shall be equipped with thermal overload protection with automatically resettable switch.



# Big Dipper® Point Source Automatic Grease Removal Systems

## W-350-IS Specifications



### FEATURES:

- Fully automatic self cleaning cycle. Removes collected grease & oils from tank without any operator assistance. Comes complete with 24-hour timer.
- Constructed of corrosion resistant materials suitable for installation in virtually any location. Attractive sanitary Stainless Steel exterior.
- Integrated Motor/Grease Outlet/Heater/Lid enables a fast, do-it-yourself unit operation reversal.
- Easy lift grease collector simplifies grease collection container emptying.
- Compact footprint.

### TECHNICAL DATA

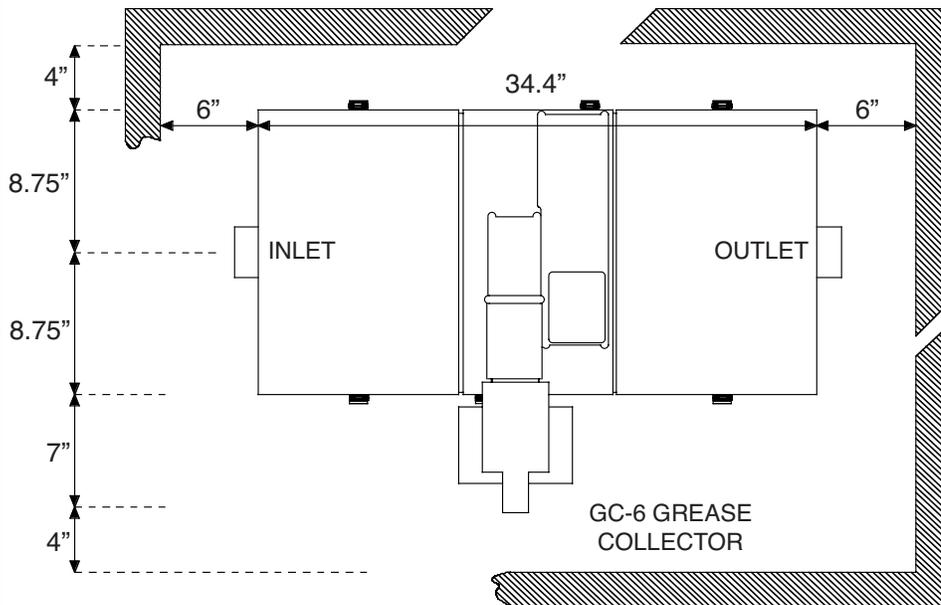
Materials:	Exterior: 304 Stainless Steel, Bright Finish
	Interior: Rotationally Molded Polyethylene
Electrical:	115 VAC, 60 Hz, 350 Watts (3 Amps)
Maximum Inlet Flow Rate:	35 GPM
Number of Skimming Wheels:	1
Skimming Rate:	35 Pounds Per Hour
Grease Retention Capacity:	70+ Pounds
Internal Solids Strainer Capacity:	2.5 Gallons



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**INSTALLATION INFORMATION**

**Suggested Minimum Footprint Dimensions**



**DO . . .**

Allow a minimum of 14" clearance for removal of unit lid.

READ instruction manual included with system before doing anything.

Install unit allowing for the minimum clearances shown.

Make sure the height above the Internal Strainer Access Cover is enough to remove the strainer.

Make piping connections with rubber "No Hub" connectors.

Keep outlet piping as straight as possible. Use only "sweep" connections.

Install vent on outlet piping.

Fill the tank with water before energizing the power to the motor and heater.

Set Programmable Time Controller for proper operating times.

**DON'T . . .**

Install "P" trap on outlet connection of tank. (Note: the unit already has an internal gas trap). Reduce pipe size on outlet piping.

**Note:**

Installations must comply with all applicable local, state, and national codes for your area.

**Job Specification:**

Grease and oils separator(s) shall be Thermaco **Big Dipper** automatic grease/oil recovery system(s) as manufactured by Thermaco, Inc., Asheboro, North Carolina as noted on plans.

**Separator Specifications:**

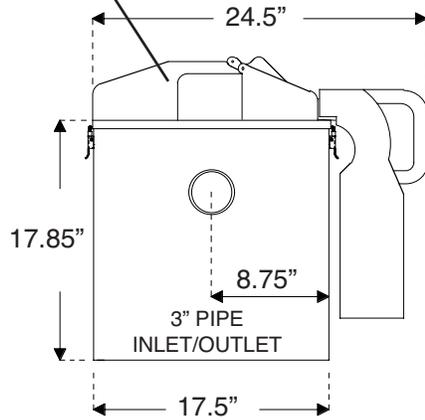
Furnish and install \_\_\_ Thermaco **Big Dipper** Model No. W-350-IS, bright finish type 304 stainless steel exterior, rotationally molded polyethylene interior automatic self-cleaning grease and oil recovery separator(s) for floor mounted or partially recessed installation, rated at 35 gallons per minute peak flow, 70 pounds of grease capacity and including as an integral part of the unit, 1 rotating gear hydrophobic wheel assembly for automatic grease/oil removal, an integral flow control device, self-regulating enclosed electric immersion heater, a vessel vent, an integral gas trap, an integral programmable 24-hour multi-event time control, a field reversible motor location, a field reversible grease/oil sump outlet, quick release stainless steel lid clamps, a gasketed and fully removable 304 stainless steel lid, a hinged lift-out strainer basket access, an internal stainless steel strainer basket for collection of coarse solids, and a separate grease and oils collection container. Electric assembly shall be tested to comply with pertinent sections of the Standards for Safety ANSI/UL 73 and/or ANSI/UL 1004. Electric motor shall be equipped with thermal overload protection with automatically resettable switch.



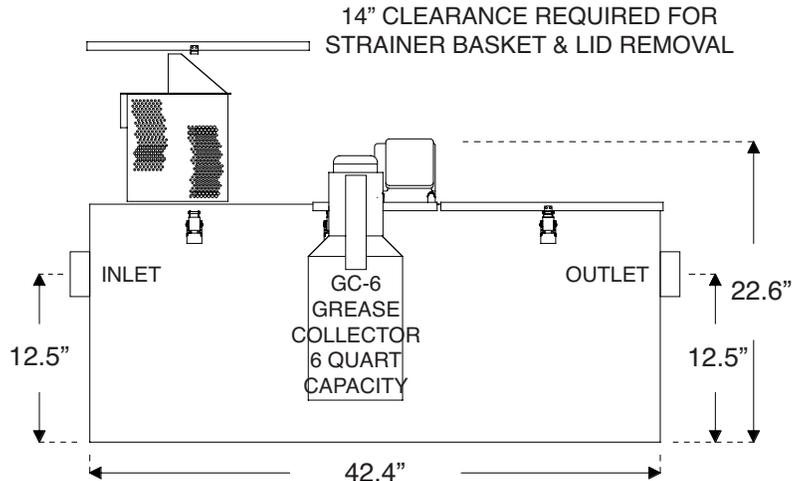
# Big Dipper® Point Source Automatic Grease Removal Systems

## W-500-IS Specifications

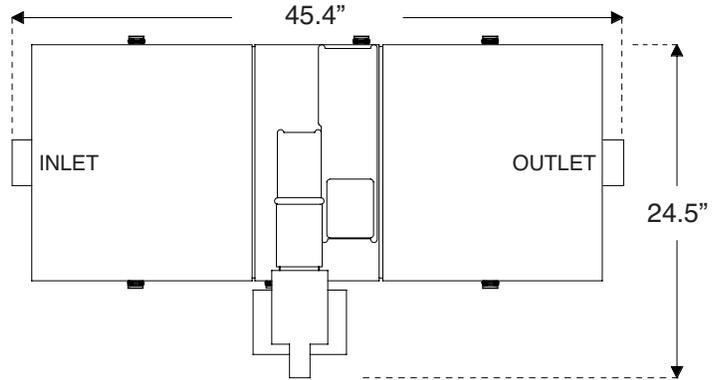
MOTOR/TIMER ENCLOSURE



**END VIEW**



**SIDE VIEW**



**TOP VIEW**

**FEATURES:**

- Fully automatic self cleaning cycle. Removes collected grease & oils from tank without any operator assistance. Comes complete with 24-hour timer.
- Constructed of corrosion resistant materials suitable for installation in virtually any location. Attractive sanitary Stainless Steel exterior.
- Integrated Motor/Grease Outlet/Heater/Lid enables a fast, do-it-yourself unit operation reversal.
- Easy lift grease collector simplifies grease collection container emptying.
- Compact footprint.

**TECHNICAL DATA**

Materials: _____	Exterior: 304 Stainless Steel, Bright Finish
	Interior: Rotationally Molded Polyethylene
Electrical: _____	115 VAC, 60 Hz, 350 Watts (3 Amps)
Maximum Inlet Flow Rate: _____	50 GPM
Number of Skimming Wheels: _____	1
Skimming Rate: _____	35 Pounds Per Hour
Grease Retention Capacity: _____	100+ Pounds
Internal Solids Strainer Capacity: _____	2.5 Gallons

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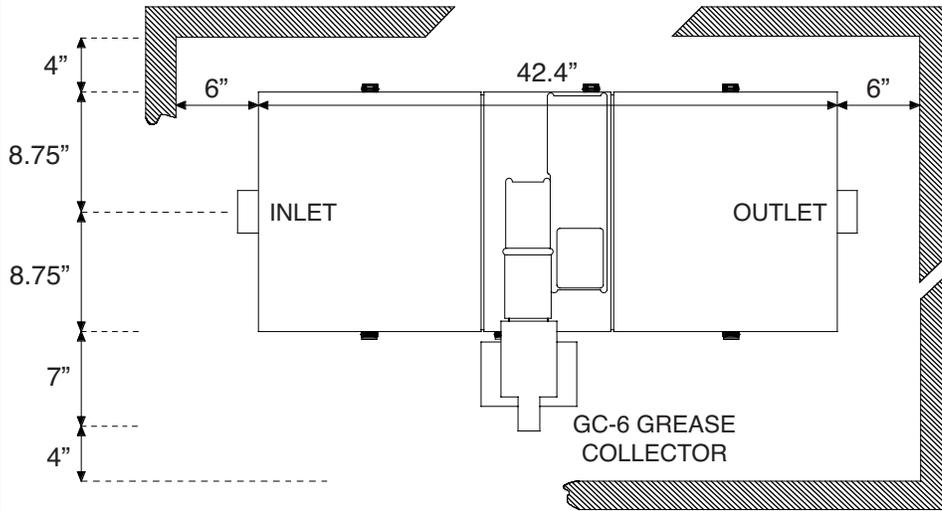


## Big Dipper® Point Source Automatic Grease Removal Systems

### W-500-IS Specifications

## INSTALLATION INFORMATION

### Suggested Minimum Footprint Dimensions



### DO . . .

Allow a minimum of 14" clearance for removal of unit lid.

READ instruction manual included with system before doing anything.

Install unit allowing for the minimum clearances shown.

Make sure the height above the Internal Strainer Access Cover is enough to remove the strainer.

Make piping connections with rubber "No Hub" connectors.

Keep outlet piping as straight as possible. Use only "sweep" connections.

Install vent on outlet piping.

Fill the tank with water before energizing the power to the motor and heater.

Set Programmable Time Controller for proper operating times.

### DON'T . . .

Install "P" trap on outlet connection of tank. (Note: the unit already has an internal gas trap).

Reduce pipe size on outlet piping.

### Note:

Installations must comply with all applicable local, state, and national codes for your area.

### Job Specification:

Grease and oils separator(s) shall be Thermaco **Big Dipper** automatic grease/oil recovery system(s) as manufactured by Thermaco, Inc., Asheboro, North Carolina as noted on plans.

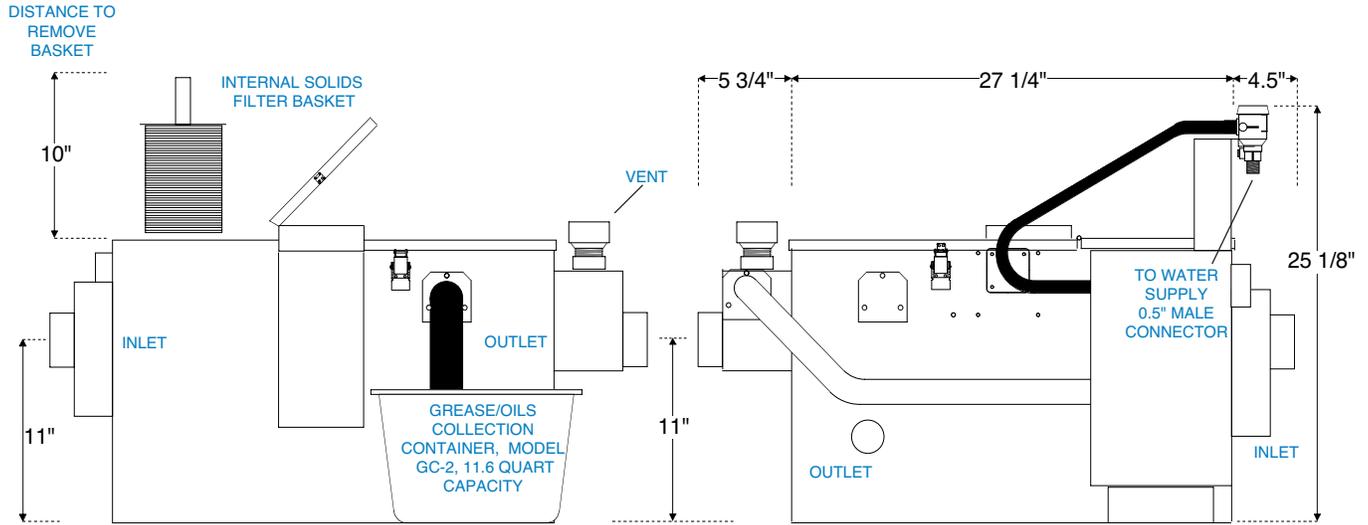
### Separator Specifications:

Furnish and install \_\_\_ Thermaco **Big Dipper** Model No. W-500-IS, bright finish type 304 stainless steel exterior, rotationally molded polyethylene interior automatic self-cleaning grease and oil recovery separator(s) for floor mounted or partially recessed installation, rated at 50 gallons per minute peak flow, 100 pounds of grease capacity and including as an integral part of the unit, 1 rotating gear hydrophobic wheel assembly for automatic grease/oil removal, an integral flow control device, self-regulating enclosed electric immersion heater, a vessel vent, an integral gas trap, an integral programmable 24-hour multi-event time control, a field reversible motor location, a field reversible grease/oil sump outlet, quick release stainless steel lid clamps, a gasketed and fully removable 304 stainless steel lid, a hinged lift-out strainer basket access, an internal stainless steel strainer basket for collection of coarse solids, and a separate grease and oils collection container. Electric assembly shall be tested to comply with pertinent sections of the Standards for Safety ANSI/UL 73 and/or ANSI/UL 1004. Electric motor shall be equipped with thermal overload protection with automatically resettable switch.



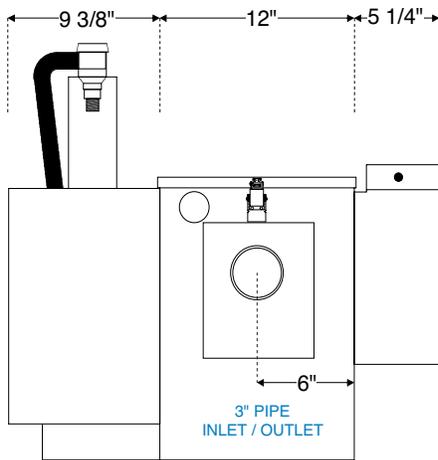
# Automatic Solids Transfer System

## W-300-AST Specifications



**FRONT VIEW**

**BACK VIEW**



**INLET END**

### FEATURES

No strainers to empty manually. The Automatic Solids Transfer feature automatically pumps incidental solids around the system.

Fully automatic self-cleaning cycle. Removes collected grease/oils from tank without any operator assistance.

Constructed of corrosion resistant materials suitable for installation in virtually any location.

Comes complete with Grease Collection Container and 24 hour Time Control.

\* Note: Not intended for use with solids larger than 1" (25 mm) in diameter. The FS-1 or ILS-1 solids strainers are recommended for use ahead of the AST system for sites with solids greater than 1".

### TECHNICAL INFORMATION

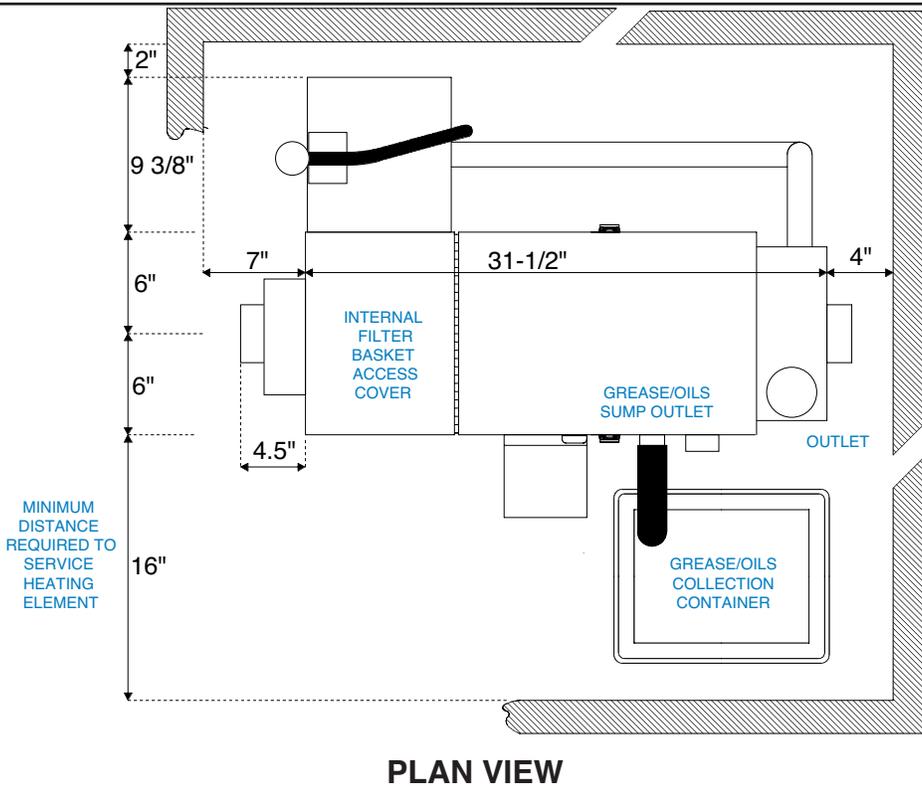
Materials: \_\_\_\_\_ 16 Gauge, 304 Stainless Steel, Bright Finish  
 Electrical: \_\_\_\_\_ 115 VAC 60 Hz 1500 Watts (13 amps)  
 Maximum Inlet Flow Rate: \_\_\_\_\_ 30 GPM  
 Number of Skimming Wheels: \_\_\_\_\_ 2  
 Skimming Rate: \_\_\_\_\_ 52.5 Pounds Per Hour  
 Grease Retention Capacity: \_\_\_\_\_ 60 Pounds  
 Eductor Pump Operation Water Requirements: \_\_\_\_\_ 5 GPM



# Automatic Solids Transfer System

## W-300-AST Specifications

### INSTALLATION INFORMATION



#### DO . . .

READ instruction manual included with system before doing anything.

Install unit allowing for the minimum clearances shown.

Provide a minimum 5 GPM, 50 PSI water supply for solids pump operation.

Make sure the height above the Internal Strainer Access Cover is enough to remove the strainer.

Make piping connections with rubber "No Hub" connectors.

Keep outlet piping as straight as possible. Use only "sweep" connections.

Install vent on outlet piping.

Fill the tank with water before energizing the power to the motor and heater.

Set Programmable Time Controllers for proper operating times.

#### DON'T . . .

Install "P" trap on outlet connection of tank. (Note: the unit already has an internal gas trap).

Reduce pipe size on outlet piping.

#### Note:

Installations must comply with all applicable local, state, and national codes for your area.

#### Job Specification:

Grease and oil separator(s) shall be Thermaco **BIG DIPPER** automatic grease/oil recovery system with Automatic Solids Transfer as manufactured by Thermaco, Inc., Asheboro, North Carolina as noted on plans.

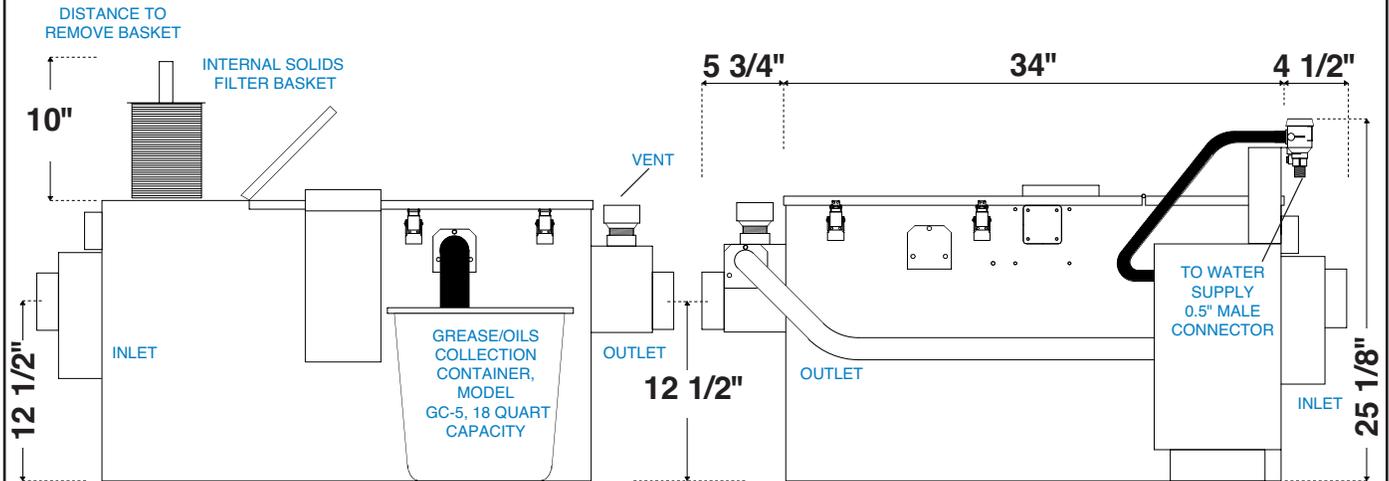
#### Separator Specifications:

Furnish and install \_\_\_ Thermaco **BIG DIPPER** Model No. W-300-AST, bright finish type 304 stainless steel automatic self-cleaning grease and oil recovery separator(s) for floor mounted, partially recessed, or below floor installation, rated at 30 gallons per minute peak flow, 60 pounds of grease capacity and including as an integral part of the unit, 2 rotating gear hydrophobic wheel assemblies for automatic grease/oil removal, an integral flow control device, self-regulating enclosed electric immersion heater, a vessel vent, an integral gas trap, an integral programmable 24 hour multi-event time control, a field reversible grease/oil sump outlet pipe, quick release stainless steel lid clamps, a gasketed and fully removable 304 stainless steel lid with safety switch, a hinged lift out strainer access, one internal stainless steel filter basket for separation of coarse solids, an eductor transfer pump controlled by repeat cycle timer, and a separate grease and oils collection container. Eductor pump shall be supplied with a 0.5" male connector for attachment to facility-supplied water supply. Eductor pump shall be supplied with an integral atmospheric vacuum breaker. Electric assembly shall be tested to comply with pertinent sections of the Standards for Safety ANSI/UL 73 and/or ANSI/UL 1004. Skimmer electric motors shall be equipped with thermal overload protection with automatically resettable switch.



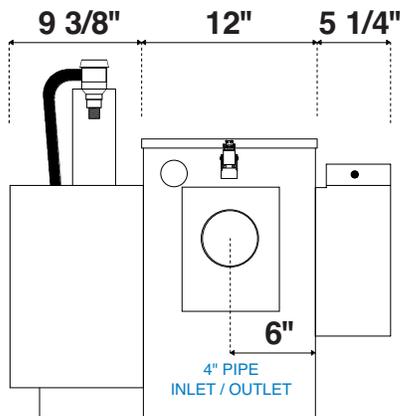
# Automatic Solids Transfer System

## W-500-AST Specifications



**FRONT VIEW**

**BACK VIEW**



**INLET END**

### FEATURES

No strainers to empty manually. The Automatic Solids Transfer feature automatically pumps incidental solids around the system.

Fully automatic self-cleaning cycle. Removes collected grease/oils from tank without any operator assistance.

Constructed of corrosion resistant materials suitable for installation in virtually any location.

Comes complete with Grease Collection Container and 24 hour Time Control.

\* Note: Not intended for use with solids larger than 1" (25 mm) in diameter. The FS-1 or ILS-1 solids strainers are recommended for use ahead of the AST system for sites with solids greater than 1".

### TECHNICAL INFORMATION

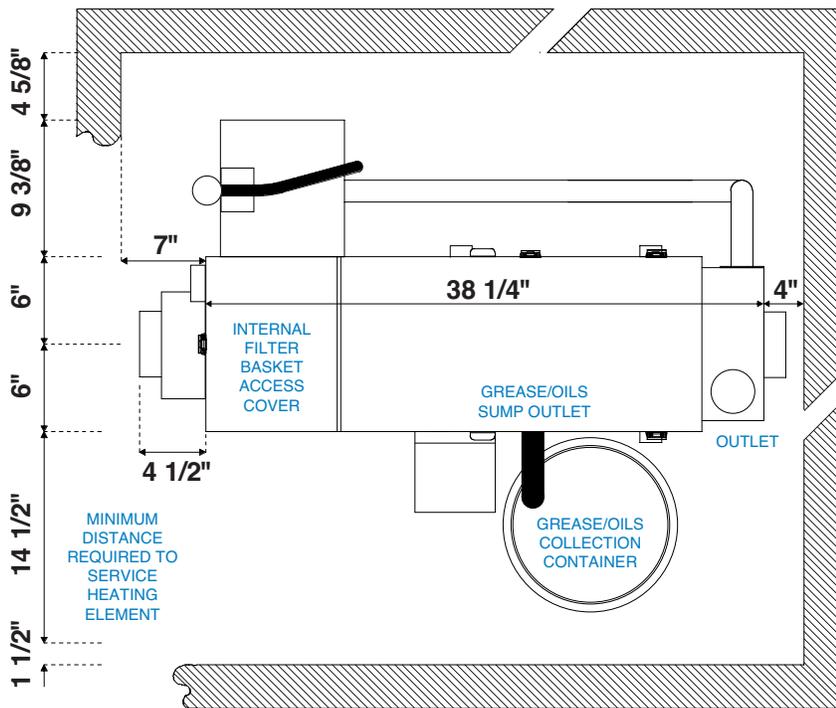
Materials: \_\_\_\_\_ 16 Gauge, 304 Stainless Steel, Bright Finish  
 Electrical: \_\_\_\_\_ 115 VAC 60 Hz 1500 Watts (20 amps)  
 Maximum Inlet Flow Rate: \_\_\_\_\_ 50 GPM  
 Number of Skimming Wheels: \_\_\_\_\_ 2  
 Skimming Rate: \_\_\_\_\_ 52.5 Pounds Per Hour  
 Grease Retention Capacity: \_\_\_\_\_ 110 Pounds  
 Eductor Pump Operation Water Requirements: \_\_\_\_\_ 5 GPM



# Automatic Solids Transfer System

## W-500-AST Specifications

### INSTALLATION INFORMATION



**PLAN VIEW**

**DO . . .**

READ instruction manual included with system before doing anything.

Install unit allowing for the minimum clearances shown.

Provide a minimum 5 GPM, 50 PSI water supply for solids pump operation.

Make sure the height above the Internal Strainer Access Cover is enough to remove the strainer.

Make piping connections with rubber "No Hub" connectors.

Keep outlet piping as straight as possible. Use only "sweep" connections.

Install vent on outlet piping.

Fill the tank with water before energizing the power to the motor and heater.

Set Programmable Time Controllers for proper operating times.

**DON'T . . .**

Install "P" trap on outlet connection of tank. (Note: the unit already has an internal gas trap).

Reduce pipe size on outlet piping.

**Note:**

Installations must comply with all applicable local, state, and national codes for your area.

**Job Specification:**

Grease and oil separator(s) shall be Thermaco **BIG DIPPER** automatic grease/oil recovery system with Automatic Solids Transfer as manufactured by Thermaco, Inc., Asheboro, North Carolina as noted on plans.

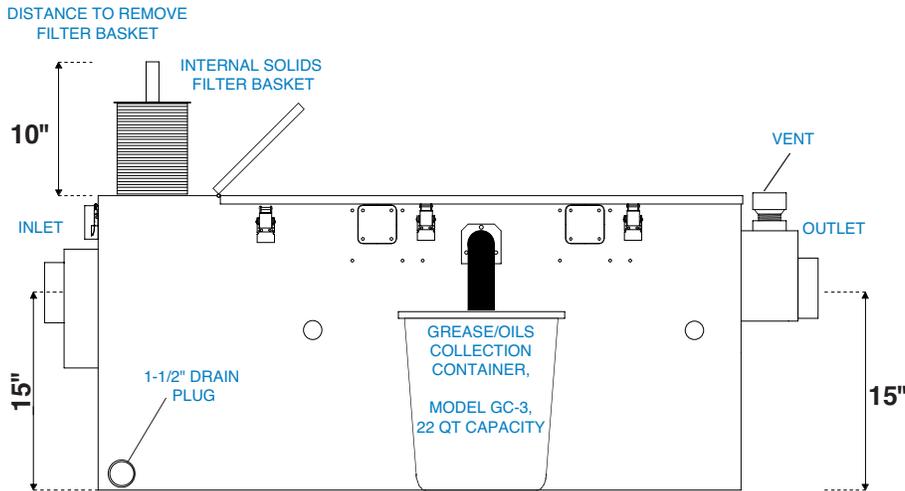
**Separator Specifications:**

Furnish and install \_\_\_ Thermaco **BIG DIPPER** Model No. W-500-AST, bright finish type 304 stainless steel automatic self-cleaning grease and oil recovery separator(s) for floor mounted, partially recessed, or below floor installation, rated at 50 gallons per minute peak flow, 110 pounds of grease capacity and including as an integral part of the unit, 2 rotating gear hydrophobic wheel assemblies for automatic grease/oil removal, an integral flow control device, self-regulating enclosed electric immersion heater, a vessel vent, an integral gas trap, an integral programmable 24 hour multi-event time control, a field reversible grease/oil sump outlet pipe, quick release stainless steel lid clamps, a gasketed and fully removable 304 stainless steel lid with safety switch, a hinged lift out strainer access, one internal stainless steel filter basket for separation of coarse solids, a eductor transfer pump controlled by repeat cycle timer, and a separate grease and oils collection container. Eductor pump shall be supplied with a 0.5" male connector for attachment to facility-supplied water supply. Eductor pump shall be supplied with an integral atmospheric vacuum breaker. Electric assembly shall be tested to comply with pertinent sections of the Standards for Safety ANSI/UL 73 and/or ANSI/UL 1004. Skimmer electric motors shall be equipped with thermal overload protection with automatically resettable switch.

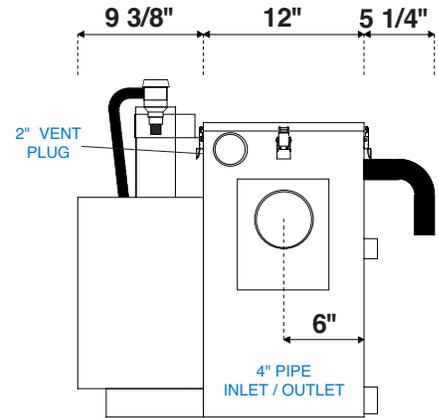


# Automatic Solids Transfer System

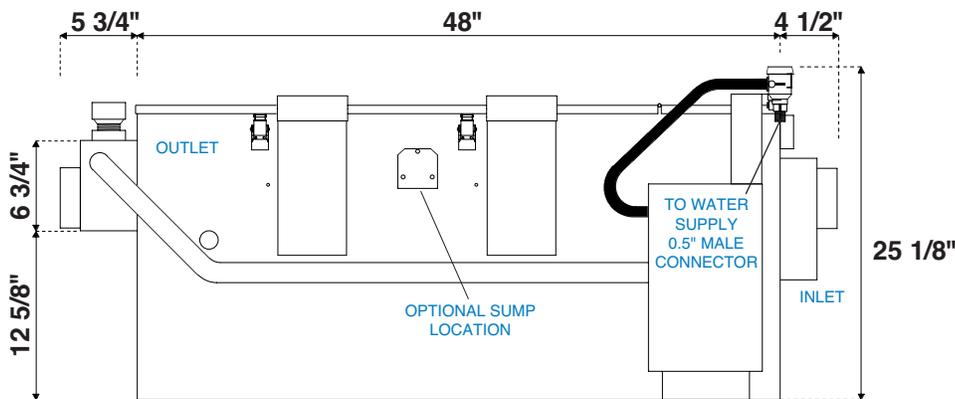
## W-750-AST Specifications



**FRONT VIEW**



**INLET END**



**BACK VIEW**

### FEATURES

No strainers to empty manually. The Automatic Solids Transfer feature automatically pumps incidental solids around the system.

Fully automatic self-cleaning cycle. Removes collected grease/oils from tank without any operator assistance.

Constructed of corrosion resistant materials suitable for installation in virtually any location.

Comes complete with Grease Collection Container and 24 hour Time Control.

\* Note: Not intended for use with solids larger than 1" (25 mm) in diameter. The FS-1 or ILS-1 solids strainers are recommended for use ahead of the AST system for sites with solids greater than 1".

### TECHNICAL INFORMATION

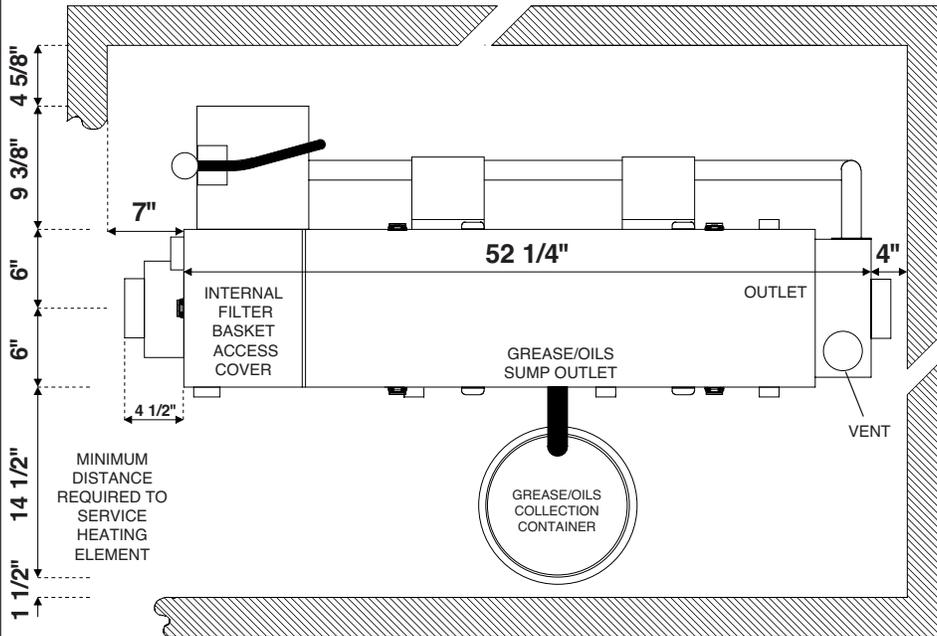
Materials: \_\_\_\_\_ 16 Gauge, 304 Stainless Steel, Bright Finish  
 Electrical: \_\_\_\_\_ (2) Motor (2) Heaters, 208-240 VAC 60 Hz 3000 Watts (30 amps) total  
 Maximum Inlet Flow Rate: \_\_\_\_\_ 75 GPM  
 Number of Skimming Wheels: \_\_\_\_\_ 6  
 Skimming Rate: \_\_\_\_\_ 138.6 Pounds Per Hour  
 Grease Retention Capacity: \_\_\_\_\_ 218 Pounds  
 Eductor Pump Operation Water Requirements: \_\_\_\_\_ 5 GPM



# Automatic Solids Transfer System

## W-750-AST Specifications

### INSTALLATION INFORMATION



**PLAN VIEW**

**DO . . .**

READ instruction manual included with system before doing anything.

Install unit allowing for the minimum clearances shown.

Provide a minimum 5 GPM, 50 PSI water supply for solids pump operation.

Make sure the height above the Internal Strainer Access Cover is enough to remove the strainer.

Make piping connections with rubber "No Hub" connectors.

Keep outlet piping as straight as possible. Use only "sweep" connections.

Install vent on outlet piping.

Fill the tank with water before energizing the power to the motor and heater.

Set Programmable Time Controllers for proper operating times.

**DON'T . . .**

Install "P" trap on outlet connection of tank. (Note: the unit already has an internal gas trap).

Reduce pipe size on outlet piping.

**Note:**

Installations must comply with all applicable local, state, and national codes for your area.

**Job Specification:**

Grease and oil separator(s) shall be Thermaco **BIG DIPPER** automatic grease/oil recovery system with Automatic Solids Transfer as manufactured by Thermaco, Inc., Asheboro, North Carolina as noted on plans.

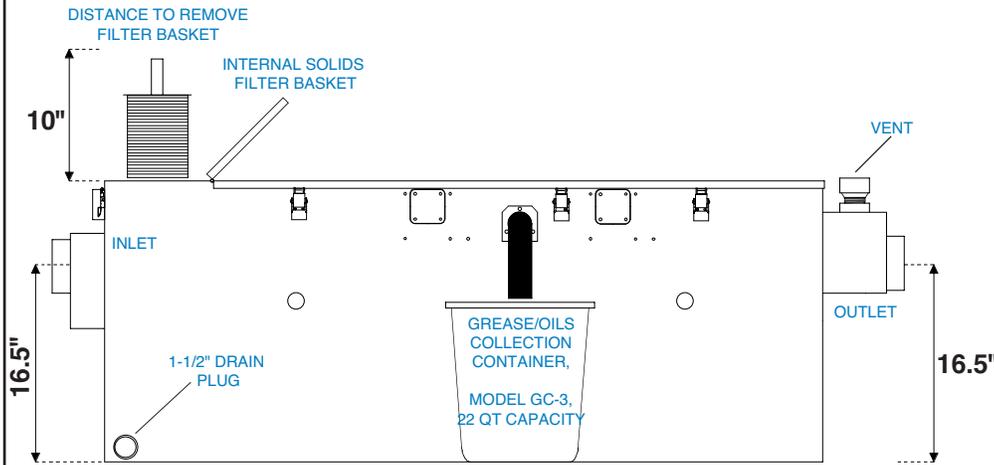
**Separator Specifications:**

Furnish and install \_\_\_ Thermaco **BIG DIPPER** Model No. W-750-AST, bright finish type 304 stainless steel automatic self-cleaning grease and oil recovery separator(s) for floor mounted, partially recessed, or below floor installation, rated at 75 gallons per minute peak flow, 218 pounds of grease capacity and including as an integral part of the unit, 6 rotating gear hydrophobic wheel assemblies for automatic grease/oil removal, an integral flow control device, self-regulating enclosed electric immersion heater, a vessel vent, an integral gas trap, an integral programmable 24 hour multi-event time control, a field reversible grease/oil sump outlet pipe, quick release stainless steel lid clamps, a gasketed and fully removable 304 stainless steel lid with safety switch, a hinged lift out strainer access, one internal stainless steel filter basket for separation of coarse solids, an eductor transfer pump controlled by repeat cycle timer, and a separate grease and oils collection container. Eductor pump shall be supplied with a 0.5" male connector for attachment to facility-supplied water supply. Eductor pump shall be supplied with an integral atmospheric vacuum breaker. Electric assembly shall be tested to comply with pertinent sections of the Standards for Safety ANSI/UL 73 and/or ANSI/UL 1004. Skimmer electric motors shall be equipped with thermal overload protection with automatically resettable switch.

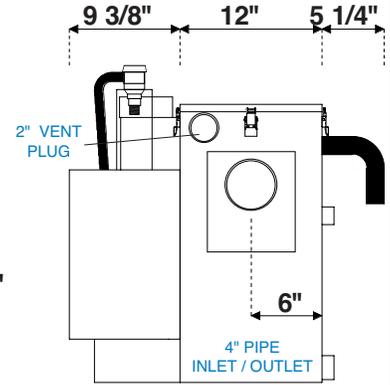


# Automatic Solids Transfer System

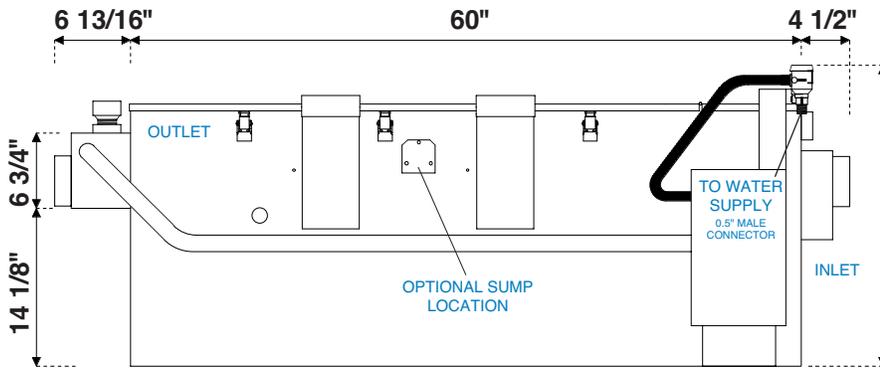
## W-1000-AST Specifications



**FRONT VIEW**



**INLET END**



**BACK VIEW**

### FEATURES

**26 3/4"** No strainers to empty manually. The Automatic Solids Transfer feature automatically pumps incidental solids around the system.

Fully automatic self-cleaning cycle. Removes collected grease/oils from tank without any operator assistance.

Constructed of corrosion resistant materials suitable for installation in virtually any location.

Comes complete with Grease Collection Container and 24 hour Time Control.

\* Note: Not intended for use with solids larger than 1" (25 mm) in diameter. The FS-1 or ILS-1 solids strainers are recommended for use ahead of the AST system for sites with solids greater than 1".

### TECHNICAL INFORMATION

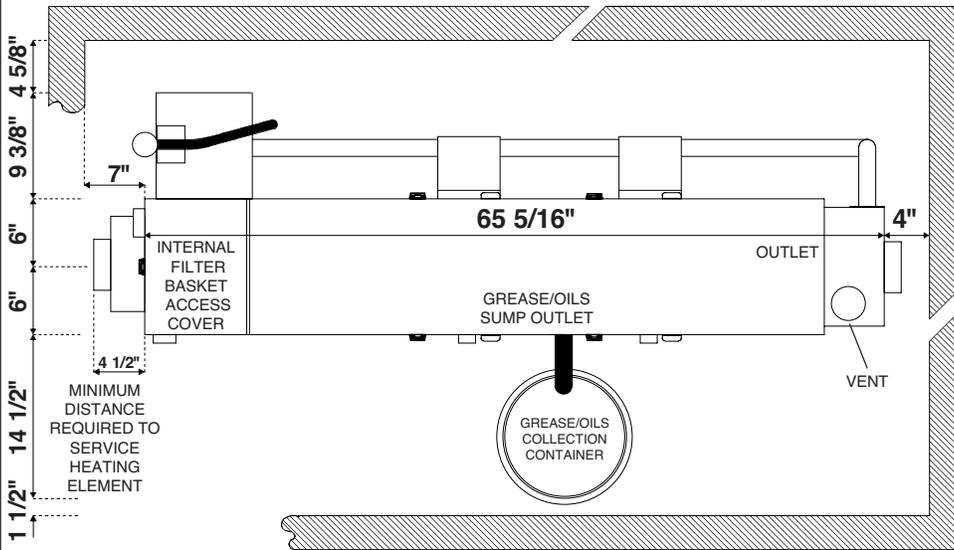
Materials: \_\_\_\_\_ 16 Gauge, 304 Stainless Steel, Bright Finish  
 Electrical: \_\_\_\_\_ (2) Motors, 208-240VAC 60 Hz 120 Watts  
 (2) Heaters, 208-240VAC 60 Hz 1 Ph 2880W. 3000W (30 amps) total  
 Maximum Inlet Flow Rate: \_\_\_\_\_ 100 GPM  
 Number of Skimming Wheels: \_\_\_\_\_ 6  
 Skimming Rate: \_\_\_\_\_ 138.6 Pounds Per Hour  
 Grease Retention Capacity: \_\_\_\_\_ 283 Pounds  
 Eductor Pump Operation Water Requirements: \_\_\_\_\_ 5 GPM



# Automatic Solids Transfer System

## W-1000-AST Specifications

### INSTALLATION INFORMATION



**PLAN VIEW**

**DO . . .**

READ instruction manual included with system before doing anything.

Install unit allowing for the minimum clearances shown.

Provide a minimum 5 GPM, 50 PSI water supply for solids pump operation.

Make sure the height above the Internal Strainer Access Cover is enough to remove the strainer.

Make piping connections with rubber "No Hub" connectors.

Keep outlet piping as straight as possible. Use only "sweep" connections.

Install vent on outlet piping.

Fill the tank with water before energizing the power to the motor and heater.

Set Programmable Time Controllers for proper operating times.

**DON'T . . .**

Install "P" trap on outlet connection of tank. (Note: the unit already has an internal gas trap).

Reduce pipe size on outlet piping.

**Note:**

Installations must comply with all applicable local, state, and national codes for your area.

**Job Specification:**

Grease and oil separator(s) shall be Thermaco **BIG DIPPER** automatic grease/oil recovery system with Automatic Solids Transfer as manufactured by Thermaco, Inc., Asheboro, North Carolina as noted on plans.

**Separator Specifications:**

Furnish and install \_\_\_ Thermaco **BIG DIPPER** Model No. W-1000-AST, bright finish type 304 stainless steel automatic self-cleaning grease and oil recovery separator(s) for floor mounted, partially recessed, or below floor installation, rated at 100 gallons per minute peak flow, 272 pounds of grease capacity and including as an integral part of the unit, 6 rotating gear hydrophobic wheel assemblies for automatic grease/oil removal, an integral flow control device, self-regulating enclosed electric immersion heater, a vessel vent, an integral gas trap, an integral programmable 24 hour multi-event time control, a field reversible grease/oil sump outlet pipe, quick release stainless steel lid clamps, a gasketed and fully removable 304 stainless steel lid with safety switch, a hinged lift out strainer access, one internal stainless steel filter basket for separation of coarse solids, an eductor transfer pump controlled by repeat cycle timer, and a separate grease and oils collection container. Eductor pump shall be supplied with a 0.5" male connector for attachment to facility-supplied water supply. Eductor pump shall be supplied with an integral atmospheric vacuum breaker. Electric assembly shall be tested to comply with pertinent sections of the Standards for Safety ANSI/UL 73 and/or ANSI/UL 1004. Skimmer electric motors shall be equipped with thermal overload protection with automatically resettable switch.



**BIG DIPPER<sup>®</sup>**

**Sizing Big Dipper Systems In  
Food Service Operations**

## How To Size A Big Dipper<sup>®</sup> Unit

The purpose of this sizing procedure is to give a specifying engineer a simple method for determining the proper size Big Dipper unit for various food service facility applications. Many different methods are in use today by the major code bodies for sizing grease traps. However, the sizing formula utilized by most codes becomes inaccurate whenever the facility contains a large number fixtures. Using such sizing methods can lead to calculations that indicate enormous flow rates being generated. In reality this never occurs because:

- 1) the building's potable water supply can not produce this great of a flow rate
- 2) all of the fixtures can not be in use at the same time, and
- 3) the only fixtures that can produce high rates of flow are those that "store and release" large volumes of water such as deep multi-compartment sinks.

The key factor to be considered when sizing an automatic grease / oils removal unit is the peak flow rate. The method shown on the sizing page takes the most commonly used sizing method and adapts it for use in single fixture service applications. An example of a single fixture is a two or three compartment sink. An individual Big Dipper unit could be plumbed to this type of fixture.

The multiple fixture sizing formula takes points 1, 2 and 3 above into consideration. As an illustration, the multiple fixture example describes common kitchen wash equipment and drainage requirements for a typical large full-service restaurant. Using the older multiple fixture unit values, the peak flow rate is calculated to be 240 gallons per minute. Using field experience data and the combined method, we find that the peak flow rate for this "typical" restaurant is actually 48 gallons per minute. At 48 gallons per minute maximum peak flow rate, a 50 gallon per minute Big Dipper system could easily handle the effluent discharges of this restaurant. For kitchen effluent flows greater than 50 GPM, Big Dipper AST systems should be utilized. Big Dipper AST (Automatic Solids Transfer) centralized grease removal systems are designed for basement locations or for larger, institutional-type kitchens such as hospitals, correctional facilities or casinos.

\* Another factor to consider is that of head pressure. Big Dipper internal flow controls are calibrated at 6 feet (1.95 m) of head pressure. If a higher head pressure is present in a location, it is recommended that a larger size Big Dipper unit be installed and the VFCA Flow Control Vent be installed.



## Sizing Point Source IS Systems

### Single Fixture Sizing Suggestions

Use this chart to help size Big Dipper equipment that will service a single fixture. Single fixture Big Dipper equipment is designed to sit on the floor beside the fixture it is servicing. For basement installations or installations where the Big Dipper will be more than 6 feet (1.95 m) beneath the fixture it is servicing Thermaco, Inc. recommends the next larger unit be installed as well as installing the FCV-1 Flow Control Vent.

Fixture	Description	Compartment Size	Pipe Size	GPM Rating	Suggested System
Sink	1-3 Compartments	18" x 18" x 12"D	2"	20	W-200-IS
Sink	1-4 Compartments	18" x 24" x 15"D	2"	25	W-250-IS
Sink	1-4 Compartments	24" x 24" x 15"D	3"	35	W-350-IS
Dishwasher*	Small Rack Type		2"	20	W-200-IS
Dishwasher*	Large Rack or Conveyor Type		3"	30	W-350-IS
Pre-Rinse Station**			N/A		W-200-IS
Ventilation Hood			Use equipment manufacturer's peak gpm rating		
Other Fixtures or Appliances			Use equipment manufacturer's peak gpm rating		

\*Some codes may require the dishwasher to be plumbed to a grease interceptor. To avoid grease/detergent emulsification, plumbing dishwashers directly into the sanitary sewer line is recommended.

\*\* Thermaco recommends the use of the FS-1 Flat Strainer in combination with the Big Dipper in pre-rinse areas.

### Single Fixture Big Dipper Equipment

<u>Model</u>	<u>GPM Rating</u>
W-200-IS	20
W-250-IS	25
W-350-IS	35
W-500-IS	50



## Sizing Multiple Fixture Installations

### Multiple Fixture Sizing Suggestions

Use this chart to help size Big Dipper equipment that will service multiple fixtures. Use standard Big Dipper systems for cases where the Big Dipper is less than four feet beneath the fixtures being serviced. For installations where the Big Dipper is servicing multiple fixtures and will be facing more than 6 feet (1.95 m) of head pressure use the next size Big Dipper system or install a Big Dipper AST (Automatic Solids Transfer) Centralized Grease Removal System. Never install a smaller Big Dipper system than the rated GPM the chart calculates.

#### Multiple Fixture Flow Calculation:

Fixture	# Fixtures	Fixture Value (GPM)	Total Fixture (GPM)	Averaging Multiplier	Flow Rating (GPM)
Floor Drains	#	7.5	# x 7.5	0.10	# GPM
3 Compartment sink	#	25	# x 25	0.25	# GPM
Pre-rinse Sink	#	15	# x 15	0.25	# GPM
Dishwasher*	#	30	# x 30	0.30	# GPM
Mop Sink	#	15	# x 15	0.25	# GPM
2 Compartment Sink	#	25	# x 25	0.25	# GPM
Hand Sink	#	7.5	# x 7.5	0.25	# GPM

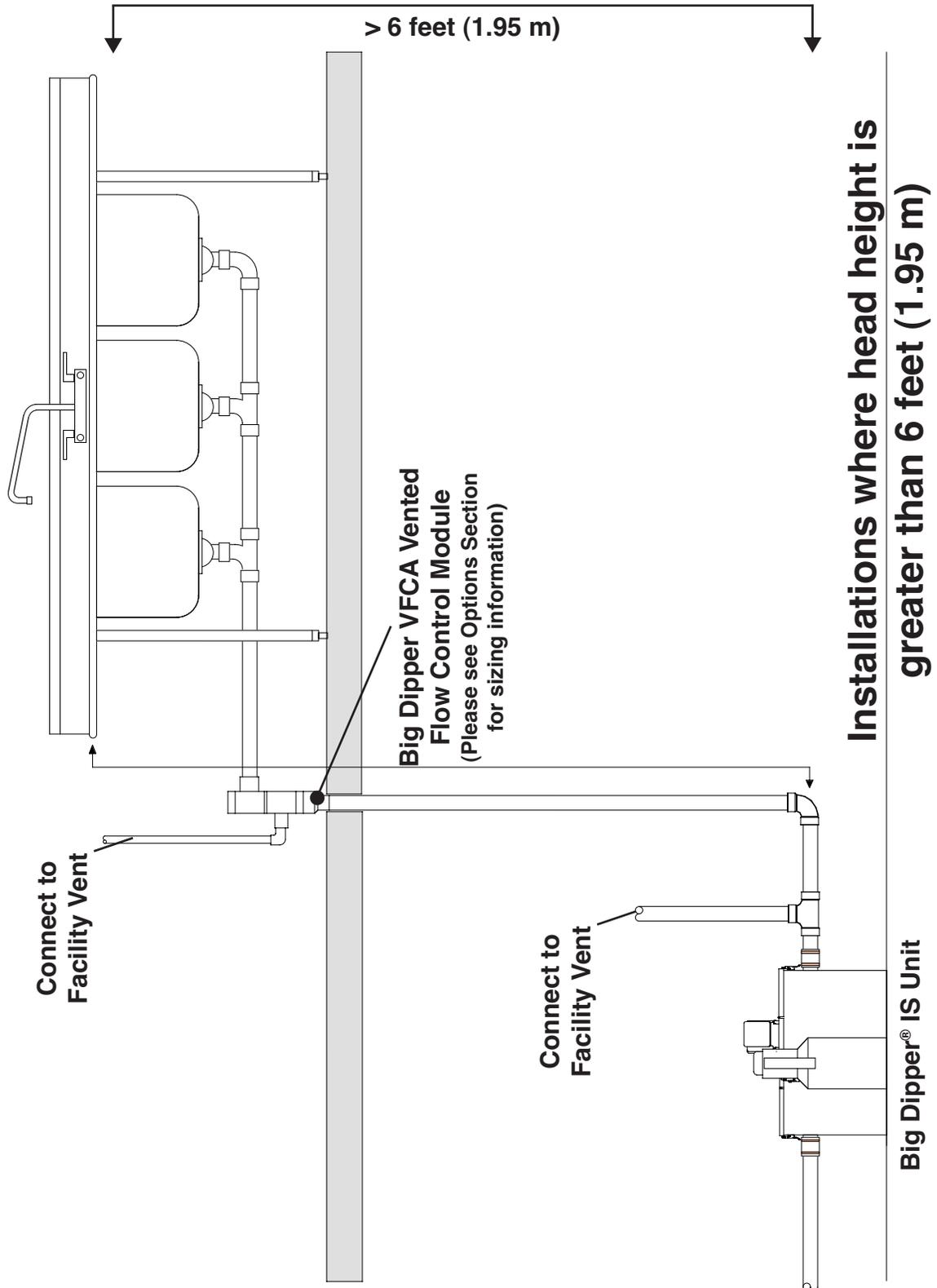
#### Example:

Fixture	# Fixtures	Fixture Value (GPM)	Total Fixture (GPM)	Averaging Multiplier	Flow Rating (GPM)
Floor Drains	12	7.5	90	0.10	9
3 Compartment sink	2	25	50	0.25	12.5
Pre-rinse Sink	1	15	15	0.25	3.75
Dishwasher*	1	30	30	0.30	9
Mop Sink	1	15	15	0.25	3.75
2 Compartment Sink	1	25	25	0.25	6.25
Hand Sink	2	7.5	15	0.25	3.75
					Total 48 gpm

**Note: Always use next larger size unit than the calculated flow rating. In this case, a W-500-IS system would adequately handle the kitchen flow.**

\*Some codes may require the dishwasher to be plumbed to a grease interceptor. To avoid grease/detergent emulsification, plumbing dishwashers directly into the sanitary sewer line is recommended.

\*\* Thermaco recommends the use of the FS-1 Flat Strainer in combination with the Big Dipper in pre-rinse areas.





## IS System Plumbing Installation Instructions

### **Locating the IS Unit**

To minimize grease build-up in piping, a Big Dipper system should be located as close as possible to the fixture it is serving. The system should be visible and easily accessible for maintenance and inspection. Make sure that adequate room is provided around the system to allow easy removal of the grease collection container and to access the electrical assembly. Make sure the height above the Big Dipper access covers is enough to properly service the system.

### **Inlet/Outlet Piping**

The inlet and outlet piping connections require flexible sleeve pipe couplings. Keep outlet piping as straight as possible. Use only "sweep" connections. Do not reduce the pipe sizing on the outlet piping. Do not install "P" trap on outlet connection of system. (Note: The system already has a internal gas trap).

### **Flow Controls**

Big Dipper systems are equipped with an internal flow regulator located inside the inlet end of the system. Verify its location and placement prior to connecting the inlet piping.

### **Fill Unit With Water Before Applying Power**

Big Dipper systems, equipped with an electric heating element, MUST be filled with water before energizing the power to the system. *Failure to do so will result in the destruction of the electric heating element. These elements will NOT be replaced under Thermaco's Limited Warranty.*

### **Venting the Outlet**

An outlet vent or approved vacuum breaker of at least 1/2 the diameter of the system's outlet connection must be present as close as possible to the Big Dipper outlet to prevent possible siphonage problems. *Failure to provide a vent for the system voids Thermaco's Limited Warranty for the system.*

### **For High Head Height IS Unit Applications Over 72" (1.95 m)**

For installations where there is head height of greater than 72" (1.95 meters), Thermaco, Inc. recommends installation of the VFC-1 Vented Flow Control supplied with the unit. Thermaco, Inc. recommends an inlet vent on the piping connection as close a possible to the inlet of the Big Dipper and tied in to the facility vent. Please see Page 4 for installation instructions.

### **Do Not Use With Food Grinders, Potato Peelers or Waste Disposal Units**

If the internal solids strainer basket is not used or if the system is connected to a Waste Disposal Unit, Garbage Grinder or potato peeler, *Thermaco's Limited Warranty for the system will be void.*

**Note: This equipment must be installed to comply with all applicable national, state, and local plumbing codes for your area. Installation should only be performed by a qualified plumber.**



## AST System Plumbing Installation Instructions

**Note: This equipment must be installed to comply with all applicable national, state, and local plumbing codes for your area. Installation should only be performed by a qualified plumber.**

### **Locating The AST Unit**

To minimize grease build-up in piping, a Big Dipper system should be located as close as possible to the fixture it is serving. The system should be visible and easily accessible for maintenance and inspection. The unit must be in a level position. **Be sure to check the Specification Sheet for your model for the exact clearances needed for installation.** If the system is located directly on the floor, the bottom should be sealed to the floor with an approved silicone type sealant. Make sure the height above the Internal Strainer access cover is enough to remove the strainer basket.

### **Eductor Pump**

The facility must provide a minimum 50 PSI water supply to the Eductor pump on the AST system. Thermaco, Inc. provides a 0.5" male connector to connect to this water supply. Models W-300-AST through W-1000-AST require at least 5 GPM flow for proper operation.

### **Inlet/Outlet Piping**

The inlet and outlet piping connections require no-hub type connectors. Keep outlet piping as straight as possible. Assure that outlet pipe has at least a slope of 1/4" per foot. Use only "sweep" connections. Don't reduce the pipe sizing on the outlet piping. Don't install "P" trap on outlet connection of system. (Note: The system already has a internal gas trap)

### **Flow Controls**

Big Dipper systems are equipped with an internal flow regulator located inside the inlet end of the system. Verify its location and placement prior to connecting the inlet piping. If your code requires a vertical type flow regulator, an approved control with a flow rating matching the system's flow rate should be used. Note: When a Big Dipper is servicing multiple fixtures, some codes require separate flow controls for each fixture.

### **Fill Unit With Water Before Applying Power**

Big Dipper systems equipped with an electric heating element *MUST be filled with water before energizing the power to the system. Failure to do so will result in the destruction of the electric heating element. These elements will NOT be replaced under Thermaco's Limited Warranty.*

### **Venting The Outlet**

An outlet vent or approved vacuum breaker of at least 1/2 the diameter of the system's outlet connection must be present within six (6) feet of the Big Dipper outlet to prevent possible siphoning problems. *Failure to provide a vent for the system voids Thermaco's Limited Warranty.*

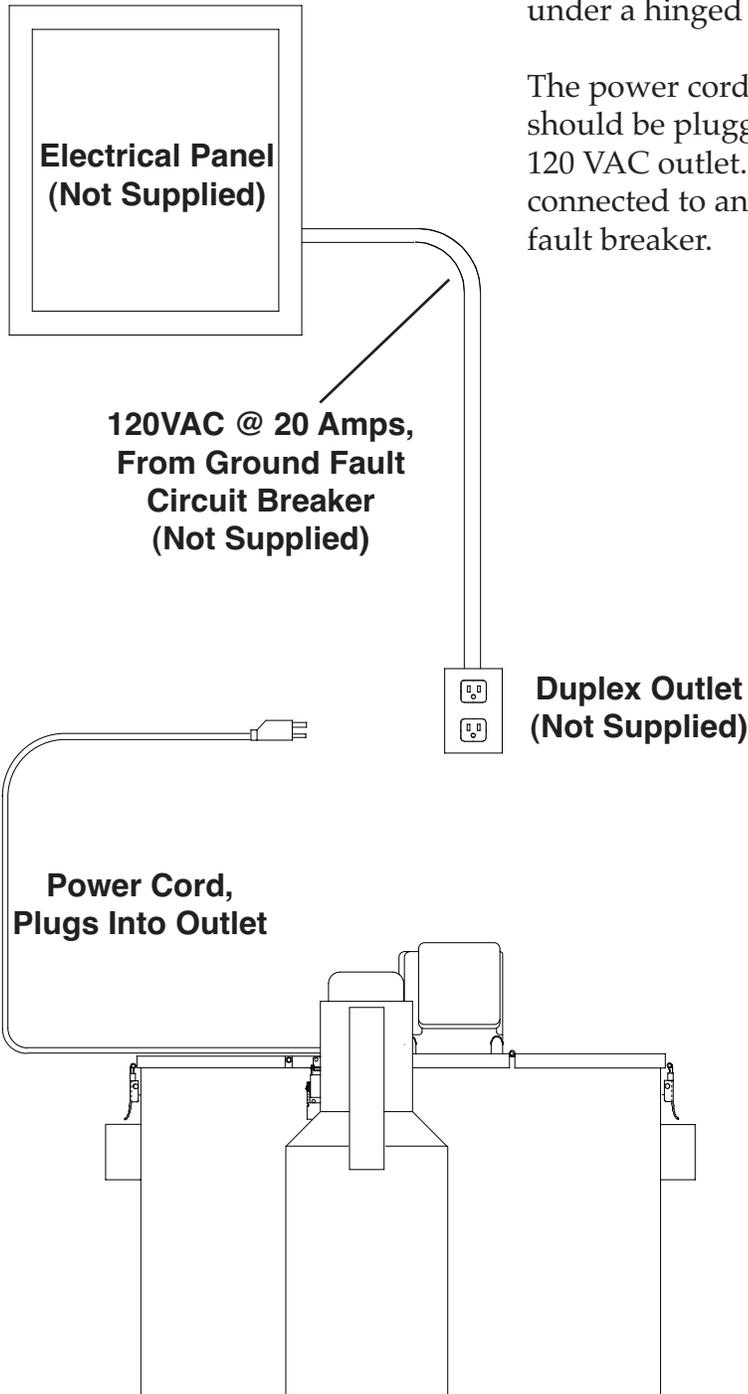
### **Do Not Use With Food Grinders, Potato Peelers or Waste Disposal Units**

If the internal solids strainer basket is not used or if the system is connected to a Food Disposal or Garbage Grinder, *Thermaco's Limited Warranty will be void.*

**Big Dipper IS System Electrical Information**

Big Dipper<sup>®</sup> Models W-200-IS through W-500-IS utilize one 24-Hour time controller. The timer is located under a hinged lid on the cover of the motor enclosure.

The power cord from the heater/motor controller should be plugged into a properly grounded 3-prong 120 VAC outlet. If possible, the Big Dipper should be connected to an electrical circuit controlled by a ground fault breaker.

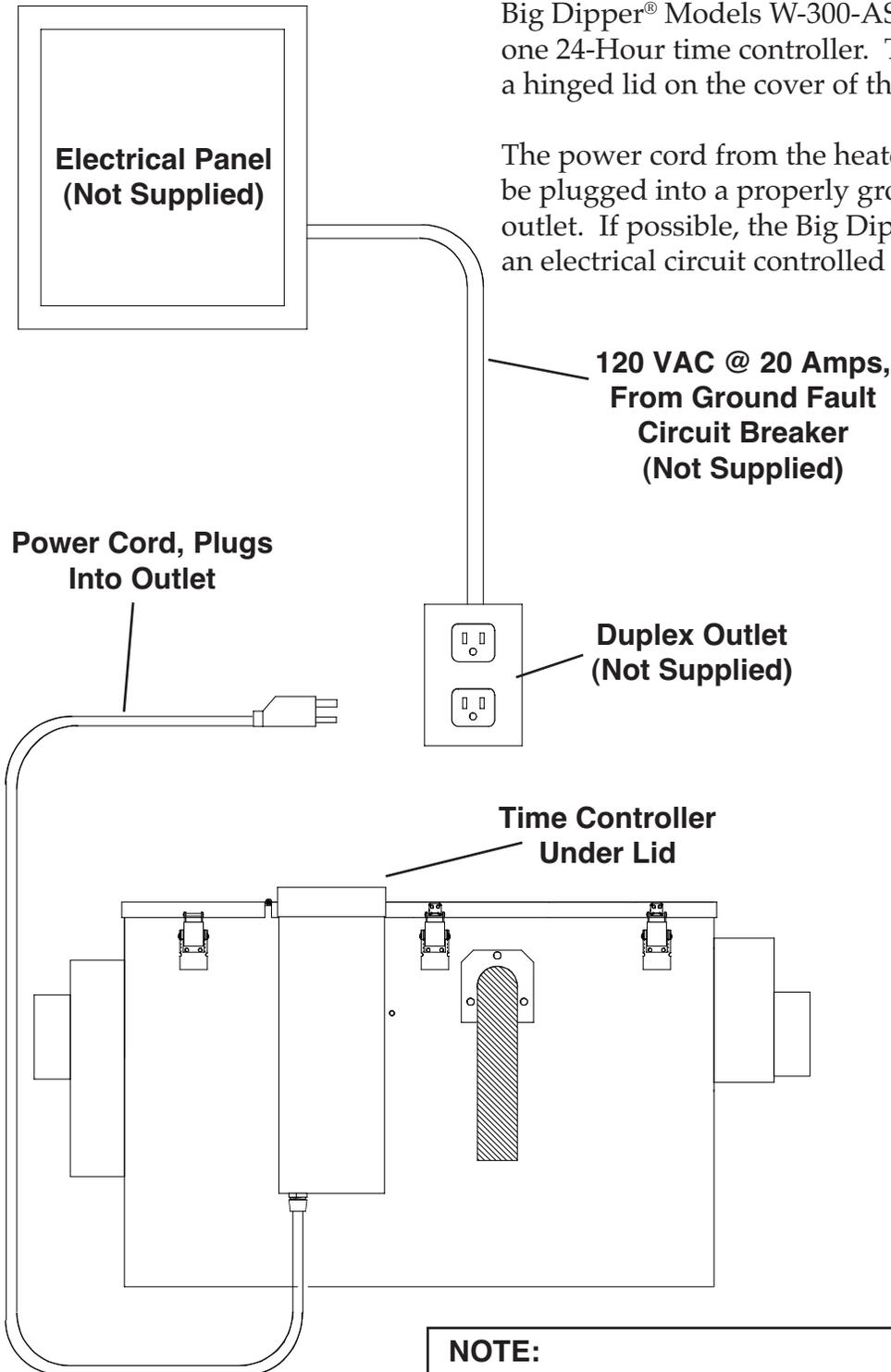


**Note: This equipment must be installed to comply with all applicable national, state, and local electrical codes for your area. Installation should only be performed by a qualified electrician.**

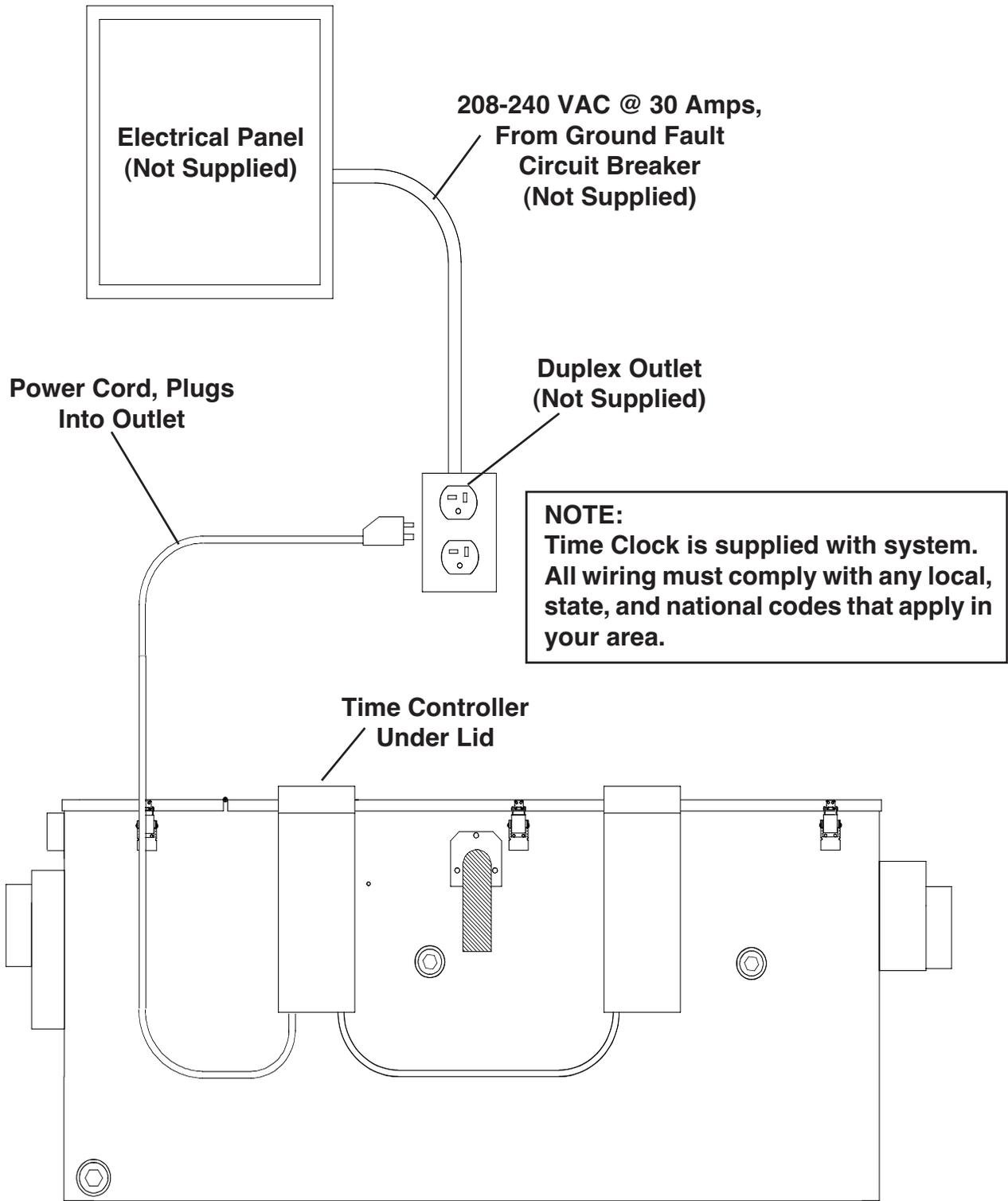
**Big Dipper AST System Electrical Information**

Big Dipper® Models W-300-AST and W-500-AST utilize one 24-Hour time controller. The timer is located under a hinged lid on the cover of the motor enclosure.

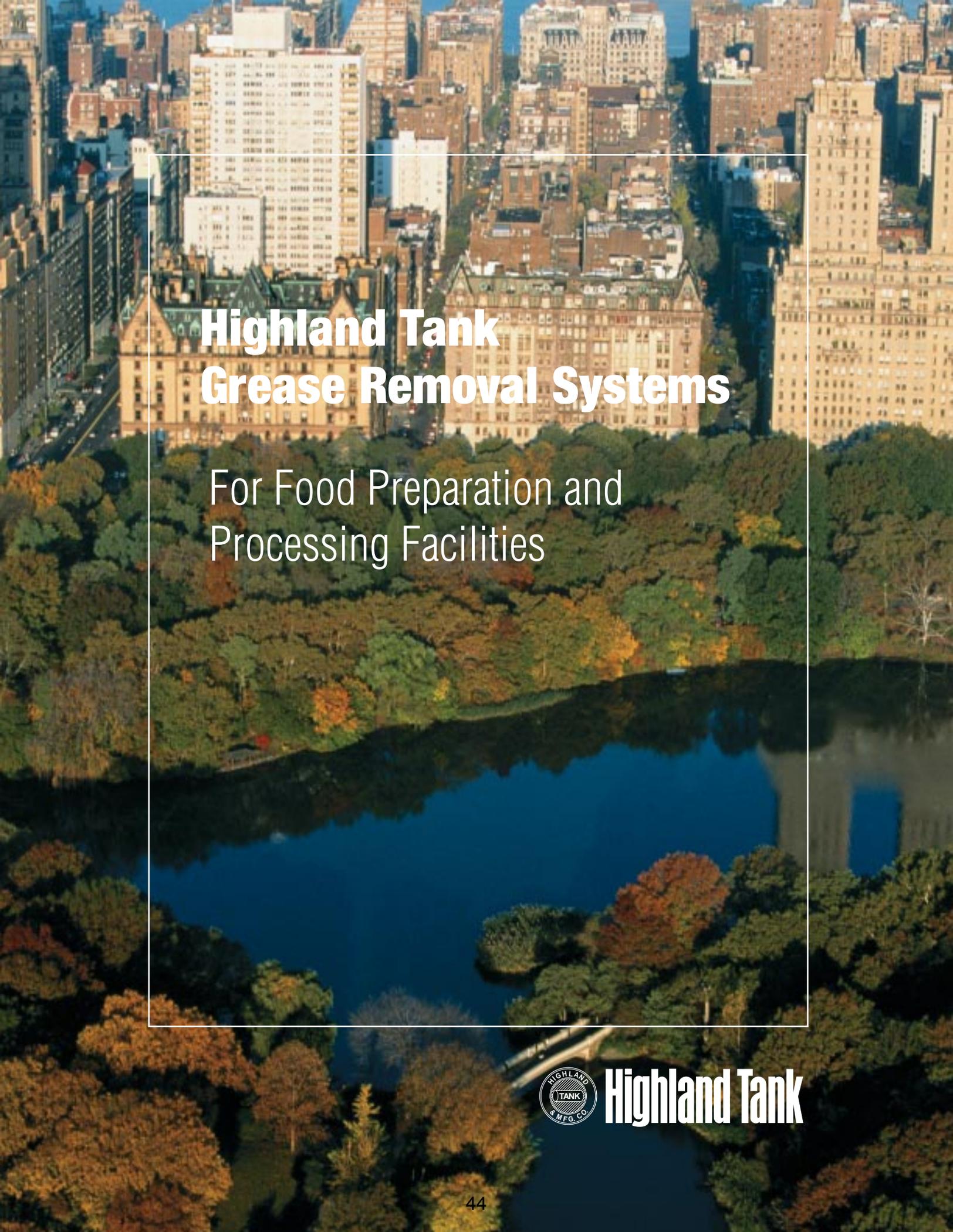
The power cord from the heater/motor controller should be plugged into a properly grounded 3-prong 120 VAC outlet. If possible, the Big Dipper should be connected to an electrical circuit controlled by a ground fault breaker.



**NOTE:**  
Time Clock is supplied with system.  
All wiring must comply with any local,  
state, and national codes that apply in your area.



### **3. Highland Tank HT-AGI Documentation (Highland Tank 2003)**

An aerial photograph of Central Park in New York City, showing the lush green trees and a large pond in the foreground. In the background, a dense urban landscape of tall buildings is visible. The text is overlaid on the image.

# Highland Tank Grease Removal Systems

For Food Preparation and  
Processing Facilities



**Highland Tank**

## *I n t r o d u c t i o n*

Each year, hundreds of pounds of fats, oils, and grease are generated by food processing plants, cosmetic and toiletry manufacturers, food warehouses, and large commercial / institutional kitchens found in hospitals, schools, convenience stores, and restaurants. This grease, if allowed to enter a sewer system, can create many problems. When fats, oils, and grease first enter the system, they cool and coagulate on the system piping. As grease solidifies on the interiors of pipes, sewage flow becomes restricted. Sewer blockages can result from this buildup, causing raw sewage to back up into the basements of homes and businesses. The presence of grease in a sewer system can also foul controls and equipment at the sewer treatment facility. High concentrations of fats, oils, and grease in wastewater can inhibit the biological processes used to treat domestic sewage.

Most sewer treatment plants are not designed to remove fats, oils and grease. The United States Environmental Protection Agency (EPA) requires that municipal sanitary sewer authorities implement pretreatment programs to control these discharges. Most restaurants and

food preparation facilities tied into a sanitary sewer system are impacted by these regulations.

For over twenty years, Highland Tank has provided innovative solutions for all types of commercial and industrial wastewater discharge problems. In 1986, Highland Tank introduced its patented oil/water separators designed to remove free-floating, petroleum-based oil, grease, and settleable oily-coated solids from wastewater. Since then, thousands of these high performance units have been placed in commercial operation worldwide.

Recently, Highland Tank acquired Lowe Engineering Co., the recognized pioneer of the Automatic Grease Recovery Unit, a device used for the recovery of fats, oils and grease from wastewater. With this acquisition, Highland Tank introduces its new comprehensive Grease Removal Systems product line featuring the HT-AGI Automatic Grease Interceptor (the original Lowe Engineering unit) and the HT-PGI Passive Grease Interceptor - Highland's single, double and triple basin grease removal tanks.

R E M O V A L S Y S T E M S

*Keeping our environment clean...*



**Highland Tank**

## *Introducing*

### ***Comprehensive Grease Removal Systems by Highland Tank***

With the introduction of its new Grease Removal Systems product line, Highland Tank once again takes the lead in commercial and industrial wastewater treatment solutions. To help food preparation and processing facilities comply with local municipal sewer pretreatment requirements, Highland has assembled the most complete line of products specifically designed for fats, oils and grease removal.

#### **Automatic Grease Interceptors**

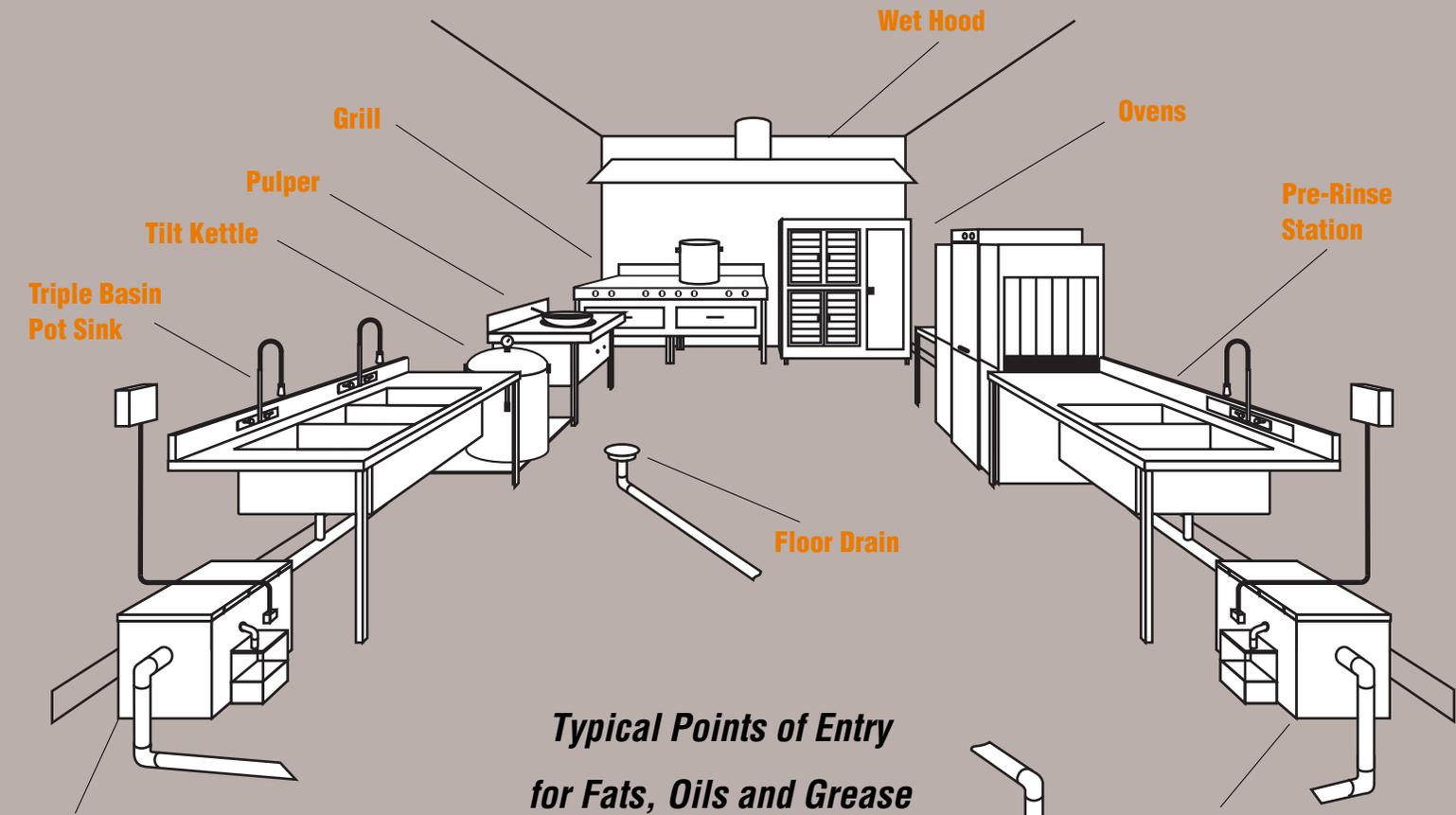
Mechanized grease interceptors for discharges of fats, oils and grease generated predominately from washing and cleaning operations in restaurants and food preparation facilities -- pot washing, pre-rinse stations, floor drains, trenches and ventilation hoods.

#### **Passive Grease Interceptors**

Gravity-based grease interceptors for large quantities of fats, oils and grease (which might interfere with proper municipal wastewater treatment) generated and discharged by large commercial/institutional kitchens and food service facilities.

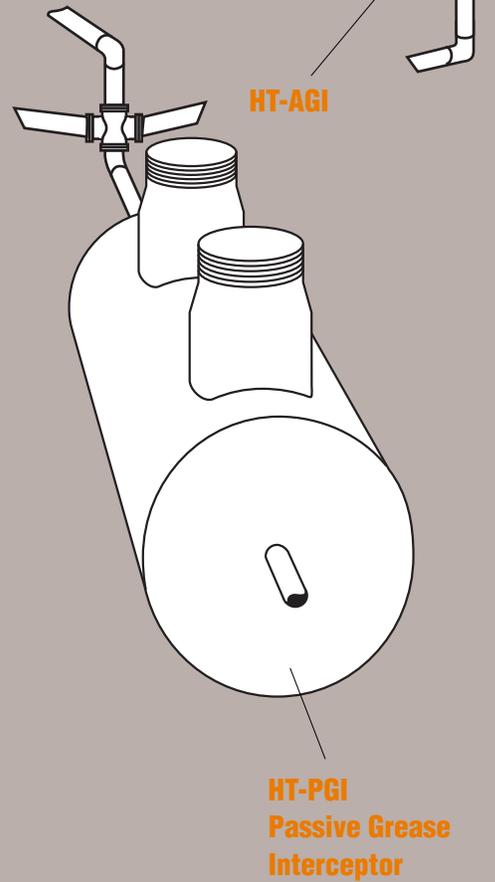
#### ***Typical Applications***

- ***Airports***
- ***Casinos***
- ***Convention Centers***
- ***Convenience Stores***
- ***Correction Facilities***
- ***Restaurants***
- ***Quick Food Restaurants and Diners***
- ***Food Processing Plants***
- ***Grocery Stores and Hypermarkets***
- ***Hospitals and Health Care Facilities***
- ***Hotels and Resorts***
- ***Military Mess Halls***
- ***Schools and University Cafeterias***
- ***Soup Kitchens***
- ***Sports Arenas***
- ***Strip Malls***
- ***Truck Stops and Travel Centers***



**Typical Points of Entry  
for Fats, Oils and Grease**

Restaurants, commercial and institutional kitchens generate fats, oils and grease that can clog drainage, if allowed to enter municipal sewer systems. The above depiction shows the various source points for fats, oils and grease found in a typical institutional kitchen.



A U T O M A T I C G R E A S E



## **The Automatic Grease Interceptor**

In 1977, Jack Lowe invented the Automatic Grease Recovery Unit. His invention has been hailed as one of the most important ecological developments in recent years. Today, his GRU has tremendous application to convenience stores, quick serve and full service restaurants, hypermarkets, food processing plants, and many institutional and commercial food service facilities. With the acquisition of Lowe Engineering by Highland Tank, Highland now offers this same original automatic Grease Recovery Unit design as the HT-AGI Automatic Grease Interceptor.

### **Proven Performance Advantages**

- **Removes and recovers nearly 100% of the fats, oils and grease** from kitchen and food processing drains
- **Reduces Total Suspended Solids** (TSS) and Biological Oxygen Demand (BOD)
- **Eliminates cleaning costs** for interior, exterior, septic system and holding tank pipe
- **Eliminates rancid buildup** and decomposition
- **Conforms** to most environmental protection programs
- **Extremely low maintenance** and lower life-cycle cost
- **Quality design and construction** UL Approved models. Conforms to PDI-G101 Plumbing and Drainage Institute (IAMPO PS 13-89)
- **Available in fourteen popular sizes** -- flow rates of 20 to 800 gpm with custom systems available, too!
- **Rugged stainless-steel construction** for superior structural strength and corrosion resistance
- **Easy access for maintenance and cleaning** with removable, vapor tight top covers
- **Suitable for aboveground or belowground** vaulted installations
- **Available with complete equipment packages** including level sensors, alarm/control panels, and pump systems
- **Original Lowe Engineering design now manufactured by Highland Tank** -- still the best grease interceptor there is!

***The Original Lowe  
Automatic Grease Interceptor --  
... now Manufactured by Highland Tank!***

## Highland HT-AGI

### The Original Automatic Grease Interceptor

## How It Works . . .

The HT- AGI Automatic Grease Interceptor is usually connected to the drain lines of the pot washing sink, pre-rinse station (prior to the dishwasher) sink, and the sewer drain, etc. -- typical sources of fats, oils and grease in commercial food establishments. The interceptor is relatively small, allowing for installation under a sink or other area of limited space. As the greasy water flows through the AGI screen basket and strikes the inlet baffle, solids are removed and the water velocity is slowed, keeping it from disturbing the grease in the retention area. As the water enters the retention area, the grease separates by gravity flotation where it remains between two baffles. The Diskimmer™ skims the liquefied grease off the water surface.

The Diskimmer™ is an electrically powered grease-skimming device, which operates on a time, or event controlled basis. The oleophilic plastic disc rotates and causes the grease to adhere to it where the disk enters the water. As the disk rotates,

the grease is carried with it until it passes between the scraper blades. The skimmed grease is scraped from the disk surface, directed into a trough, and drained via a conduit from the interceptor into a disposal container. Clean water flows under the discharge baffle and out of the AGI to the sewer drain. If properly maintained, the AGI is capable of reducing the floatable fats, oils, and grease content in the discharge wastewater to 100 ppm or less!

The AGI is fitted with one or two thermostatically controlled electric immersion heaters which maintain the collected grease in a liquid state for skimming. The unit is also fitted with a 120 Volt/60 hertz gear motor to operate the Diskimmer™. Two 24-hour clock timers control the system. Each timer has two on and off cycles.

The HT- AGI is designed to remove grease daily, collecting it neatly in a container for disposal or recycling. Screen basket maintenance, which is done daily, is fast and easy to do.

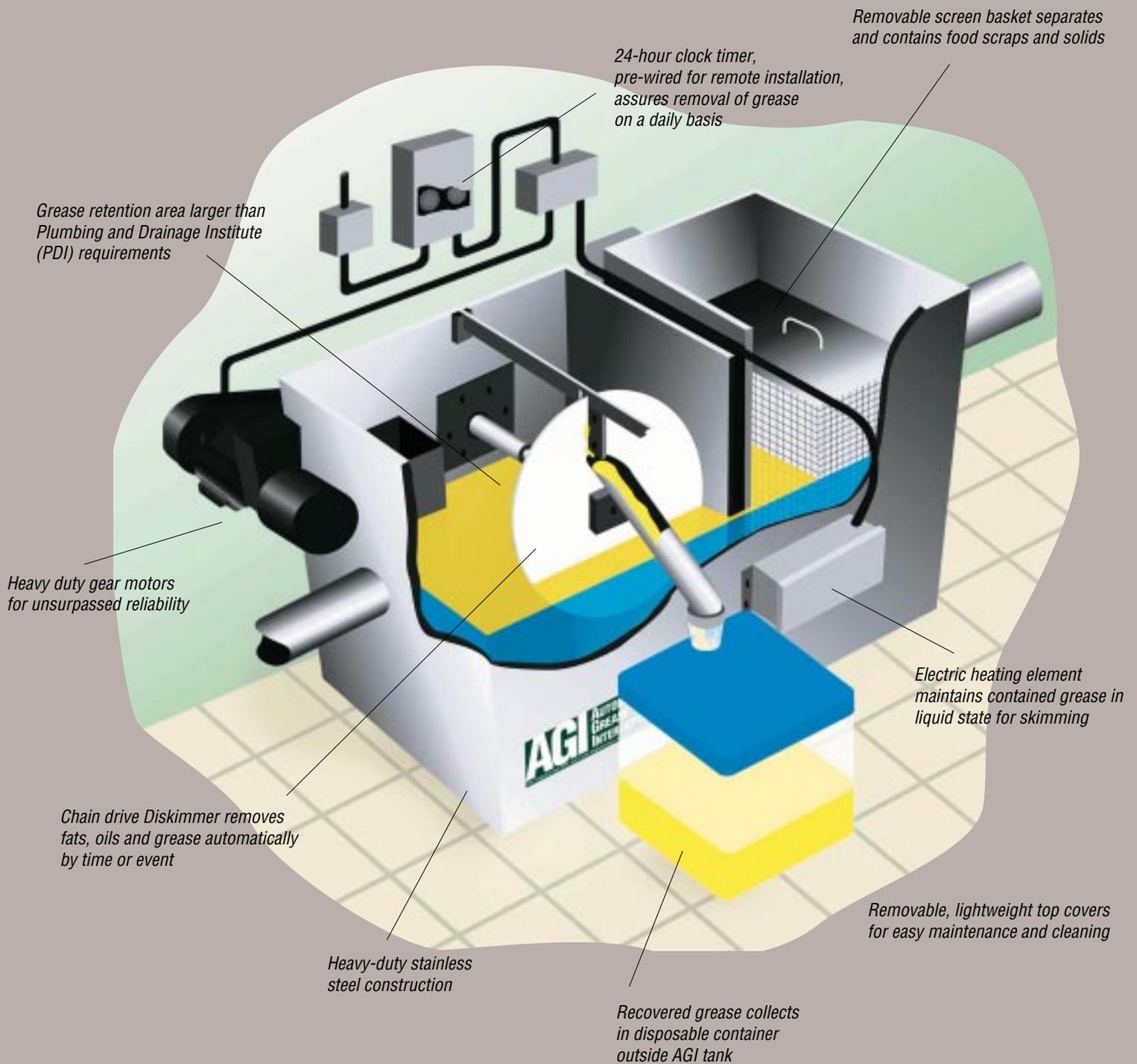
U.S. Patent #'s 4,051,024  
4,268,396 5,030,357  
Canadian Patent # 1,097,227  
U.K. Patent # 1,584,095

UL Listed 1D42 Waste Disposer  
Conforms to PDI G101

City of New York Material and Equipment  
Acceptance MEA NO. 251-91-E  
Massachusetts State Plumbing Code CMR-248  
Foxwoods Resorts Casino Vendor I.D.  
MPGE #6451  
New Jersey Casino Control Commission  
Vendor I.D. NO. 02066  
Washington Suburban Sanitary Commission (WSSC)

## Highland HT-AGI

### The Original Automatic Grease Interceptor

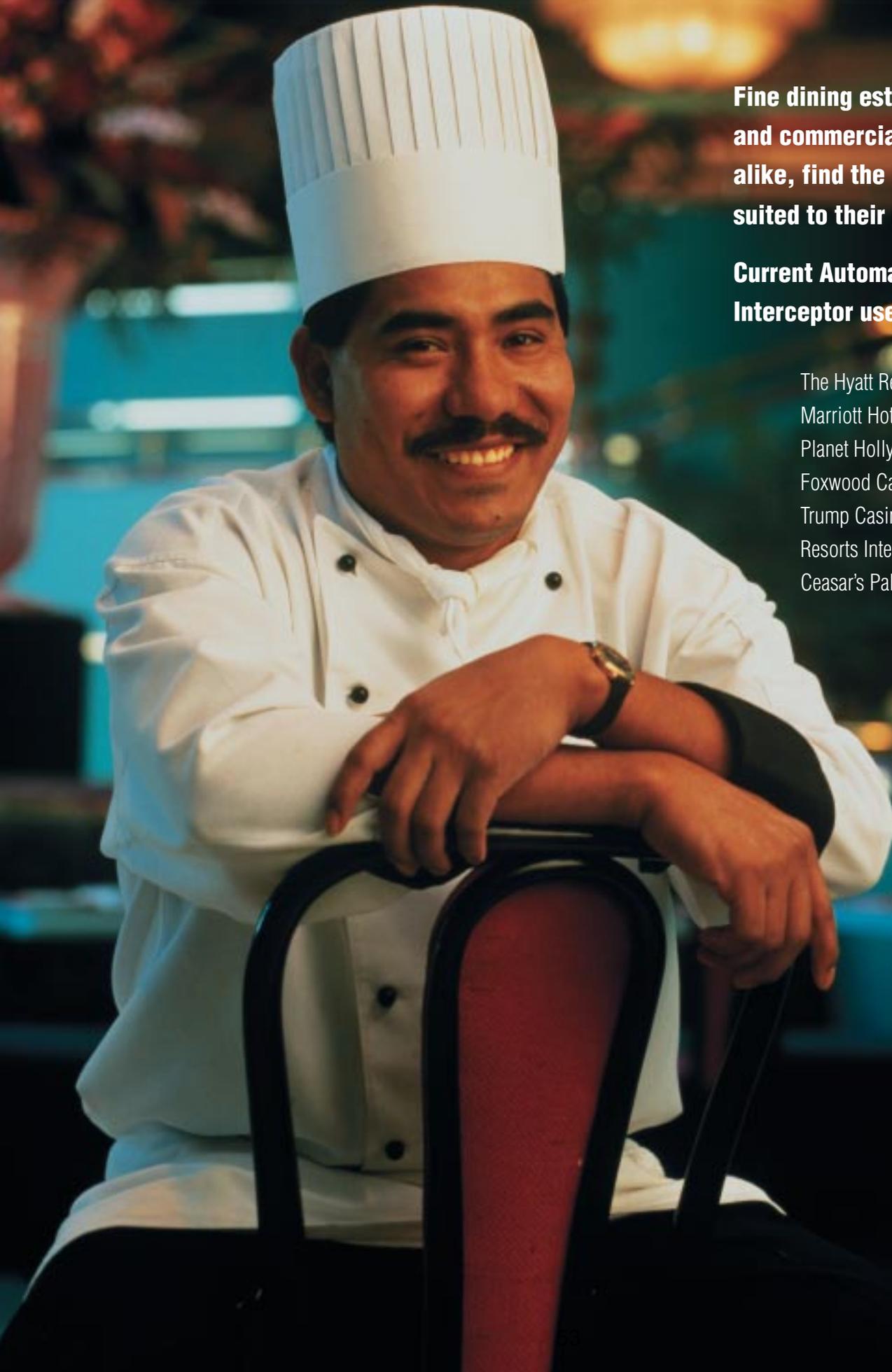


**A U T O M A T I C G R E A S E**

**Fine dining establishments and commercial restaurants alike, find the HT-AGI ideally suited to their needs.**

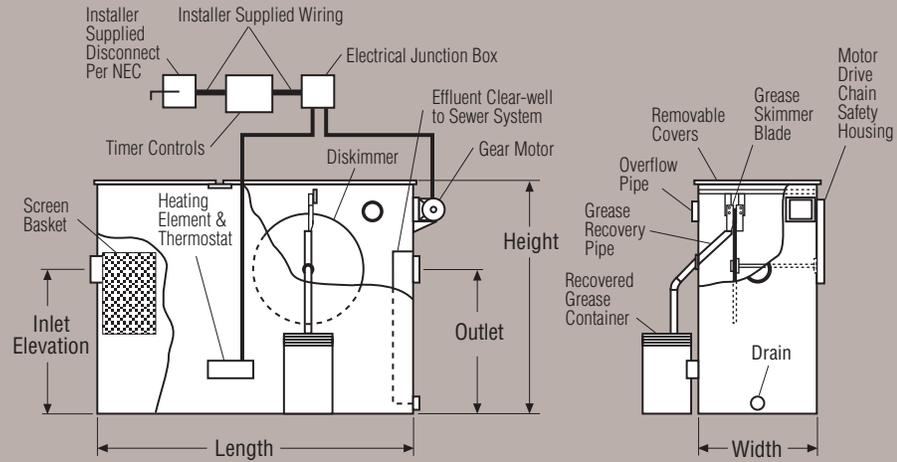
**Current Automatic Grease Interceptor users include:**

The Hyatt Regency  
Marriott Hotels  
Planet Hollywood  
Foxwood Casino  
Trump Casinos  
Resorts International  
Caesar's Palace

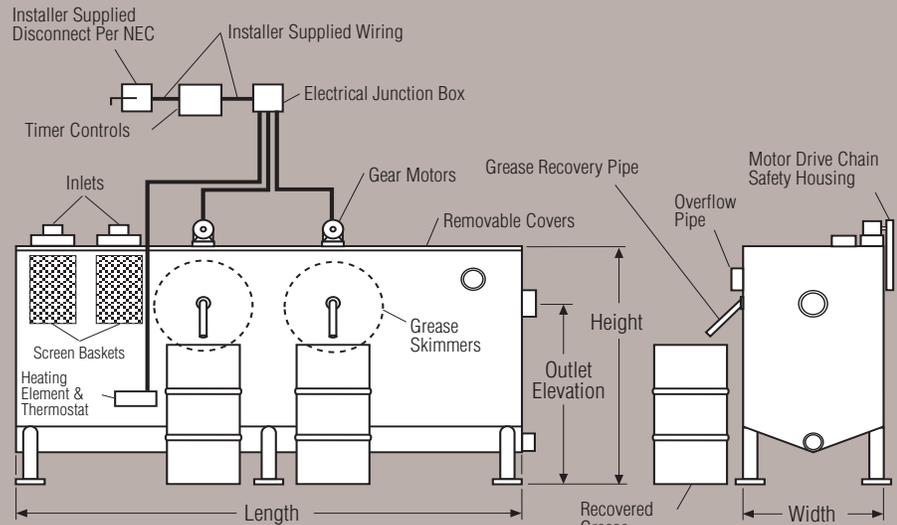


# Highland HT-AGI

## General Arrangements



Sizes 20 - 100



Sizes 150 - 800

## Available Models

Model	Dimensions			Static Water (Gallons)	Operating Grease Volume (lbs.)	Inlet/Outlet (Diameter)	Inlet/Outlet (Height)	Approx. Weight (lbs.)	
	Capacity	Length	Width						Height
AGI-20		2'2.25"	1'2"	1'6"	12.7	52	2"/2"	9"/9"	110
AGI-25		2'9"	1'4"	1'6"	17.1	68	3"/3"	9"/9"	115
*AGI-L25		3'4"	1'10"	1'6"	14.8	67	3"/3"	6"/6"	125
*AGI-H25		3'0"	1'5"	1'7"	22.5	93	3"/3"	10"/10"	125
AGI-35		3'0"	1'6"	2'2"	43.5	196	3"/3"	17"/17"	165
AGI-50		3'4"	1'6"	2'8.25"	50.0	218	4"/4"	18"/18"	183
AGI-75		4'0"	1'6"	2'11.75"	75.0	333	4"/4"	22"/22"	280
AGI-100		5'0"	1'8"	2'11.75"	103.9	467	4"/4"	22"/22"	320
**AGI-150		6'0"	2'6"	5'2"	232.0	800	4"/4"	**/48"	**
**AGI-200		7'6"	2'6"	5'2"	290.0	1,225	4"/4"	**/48"	**
**AGI-250		9'0"	2'6"	5'2"	341.5	1,436	5"/5"	**/48"	**
**AGI-400		13'0"	2'6"	5'2"	493.0	1,973	5"/5"	**/48"	**
**AGI-600		14'6"	2'6"	5'2"	697.0	2,564	6"/6"	**/48"	**
**AGI-800		18'0"	3'0"	5'2"	837.0	4,876	6"/8"	**/48"	**

\* L - Lower plumbing connections, H - Higher plumbing connections.

\*\* These models are customized to site specific requirements - dimensions, weight and operating grease volume may vary. Minimal height adjustment can be specified - consult factory for assistance.

† National Plumbing Code requires a minimum 2 lbs. of grease retention for each GPM of flow. Grease holding capacity at breakdown is determined by a minimum 85% efficiency rating in real life applications and installed according to specification.



# Highland Tank

1510 Stoystown Road  
Friedens, PA 15541-7402

Tel 814-443-6800  
Fax 814-444-8662

[www.highlandtank.com](http://www.highlandtank.com)

# AGI-15 - 100 Automatic Grease



1D42  
WASTE DISPOSER



## AGI Automatic Grease Interceptors

Low Engineering Model AGI Automatic Grease Interceptors are designed to intercept and remove large quantities of fats, oils, and grease (FOG) discharged from food service facilities and large commercial/institutional kitchens, which might interfere with the proper drainage and treatment of municipal wastewater.

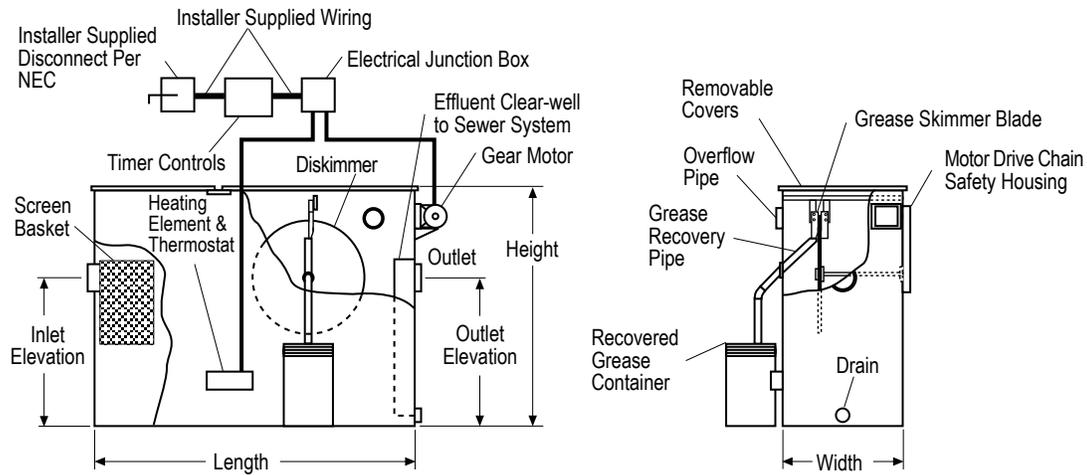
Model AGI Automatic Grease Interceptors are relatively small, allowing installation in a kitchen under a sink or other limited space. Model AGI Automatic Grease Interceptors incorporate an electrically powered grease-skimming device.

During operation, the grease is separated by gravity floatation. Since grease is lighter than water, it floats and can be skimmed off the top surface of the water on a time or event controlled basis. The skimmed grease is essentially scraped or wiped from the skimmer surface, removed from the interceptor, and collected in a waste disposal container. The accumulated grease and oils can be disposed of or recycled.

## Proven Performance

- Recovers, removes and recycles fats, oils and grease.
- Tested by the U.S. Testing Co. to conform to Plumbing and Drainage Institute (PDI) PDI-G101 (IAMPO PS 13-89)
- Extremely low maintenance - only one moving part!
- Quality design and construction
- The Low Engineering Automatic Grease Interceptor - The Original Automatic - Still the best available interceptor!

## General Arrangement



Model Capacity	Dimensions			Static Water (Gallons)	†Grease Holding Capacity (lbs.)	Inlet / Outlet Diameter	Inlet / Outlet Height
	Length	Width	Height				
<b>AGI-15</b>	1'10.25"	1'0"	1'2"	9.2	56	2" / 2"	9" / 9"
<b>AGI-20</b>	2'2.25"	1'2"	1'6"	12.7	77	2" / 2"	9" / 9"
<b>AGI-25</b>	2'9"	1'4"	1'6"	17.1	103	3" / 3"	9" / 9"
*AGI-L25	3'4"	1'10"	1'6"	14.8	100	3" / 3"	6" / 6"
*AGI-H25	3'0"	1'5"	1'7"	22.5	139	3" / 3"	10" / 10"
<b>AGI-35</b>	3'0"	1'6"	2'2"	43.5	295	3" / 3"	17" / 17"
<b>AGI-50</b>	3'4"	1'6"	2'8.25"	50.0	327	4" / 4"	18" / 18"
<b>AGI-75</b>	4'0"	1'6"	2'11.75"	75.0	505	4" / 4"	22" / 22"
<b>AGI-100</b>	5'0"	1'8"	2'11.75"	103.9	701	4" / 4"	22" / 22"

† National Plumbing Code requires a minimum 2 lbs. of grease retention for each GPM of flow. Grease holding capacity at breakdown is determined by a minimum 85% efficiency rating in real life applications and installed according to specification.

\* L - Low inlet/outlet height, H - High inlet/outlet height.

\*\* □

## Advantages

- Removes and recovers nearly 100% of the fats, oils and grease from kitchen and food processing drains.
- Removes grease automatically - timed or by event.
- Constructed of stainless steel and other corrosion resistant materials - suitable for installation in almost any location.
- Includes an electric immersion heater to maintain grease temperature and consistency for effective removal.
- Recovered grease is collected in an external Waste Grease Container.
- Easy access to interior for maintenance and cleaning.
- Eliminates costs of cleaning pipes and/or holding tanks inside and outside of the building.
- Removable screen basket collects and contains solids.
- Automatic timing device assures removal of grease on a daily basis.
- Removal of grease quickly eliminates decomposition and rancid chemical reactions.
- Reduces Total Suspended Solids (TSS) and Biological Oxygen Demand (BOD) loading.
- Recycled grease conforms to most environmental protection programs.
- Extensive range of standard sizes and capacities; Custom manufacturing is available.

Please visit us at [www.highlandtank.com](http://www.highlandtank.com)



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FAX 444-8662

# AGI-150 - 800 Automatic Grease Interceptors

**Lowe Engineering**



## **AGI Automatic Grease Interceptors**

Low Engineering Model AGI Automatic Grease Interceptors are designed to intercept and remove large quantities of fats, oils, and grease (FOG) discharged from food service facilities and large commercial/institutional kitchens, which might interfere with the proper drainage and treatment of municipal wastewater.

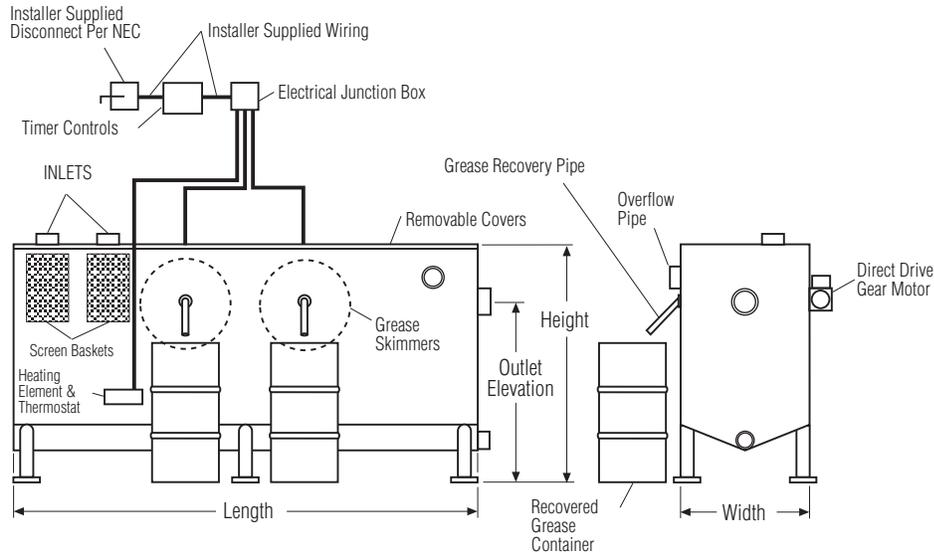
Model AGI Automatic Grease Interceptors are relatively small, allowing installation in a kitchen under a sink or other limited space. Model AGI Automatic Grease Interceptors incorporate an electrically powered grease-skimming device.

During operation, the grease is separated by gravity floatation. Since grease is lighter than water, it floats and can be skimmed off the top surface of the water on a time or event controlled basis. The skimmed grease is essentially scraped or wiped from the skimmer surface, removed from the interceptor, and collected in a waste disposal container. The accumulated grease and oils can be disposed of or recycled.

## **Proven Performance**

- Recovers, removes and recycles fats, oils and grease.
- Constructed to conform to Plumbing and Drainage Institute (PDI) PDI-G101 Code (IAMPO PS 13-89)
- Extremely low maintenance - only one moving part!
- Quality design and construction
- The Lowe Engineering Automatic Grease Interceptor - The Original Automatic - Still the best available interceptor!

## General Arrangement



Model Capacity	Dimensions			Static Water (Gallons)	†Grease Holding Capacity (lbs.)	Inlet/ Outlet Diameter	Inlet/ Outlet Height
	Length	Width	Height				
<b>AGI-150</b>	6'0"	2'6"	5'2"	232.0	1,243	4"/4"	**/48"
<b>AGI-200</b>	7'6"	2'6"	5'2"	290.0	1,677	4"/4"	**/48"
<b>AGI-250</b>	9'0"	2'6"	5'2"	341.5	2,012	5"/5"	**/48"
<b>AGI-400</b>	13'0"	2'6"	5'2"	493.0	3,120	5"/5"	**/48"
<b>AGI-600</b>	14'6"	2'6"	5'2"	697.0	4,270	6"/6"	**/48"
<b>AGI-800</b>	18'0"	3'0"	5'2"	837.0	6,597	6"/8"	**/48"

† National Plumbing Code requires a minimum 2 lbs. of grease retention for each GPM of flow. Grease holding capacity at breakdown is determined by a minimum 85% efficiency rating in real life applications and installed according to specification.

\*\* Inlet can be directed through top or back of unit. Minimal height adjustment can be specified - consult factory for assistance.

## Advantages

- Removes and recovers nearly 100% of the fats, oils and grease from kitchen and food processing drains.
- Removes grease automatically - timed or by event.
- Constructed of stainless steel and other corrosion resistant materials - suitable for installation in almost any location.
- Includes an electric immersion heater to maintain grease temperature and consistency for effective removal.
- Recovered grease is collected in an external Waste Grease Container.
- Easy access to interior for maintenance and cleaning.
- Eliminates costs of cleaning pipes and/or holding tanks inside and outside of the building.
- Removable screen basket collects and contains solids.
- Automatic timing device assures removal of grease on a daily basis.
- Removal of grease quickly eliminates decomposition and rancid chemical reactions.
- Reduces Total Suspended Solids (TSS) and Biological Oxygen Demand (BOD) loading.
- Recycled grease conforms to most environmental protection programs.
- Extensive range of standard sizes and capacities; Custom manufacturing is available.

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#### **4. Remediator® Documentation (Smith 2002)**

**THE REMEDIATOR®**

Jay R. Smith Mfg. Co.

# Pioneering New Solutions

T o G r e a s e I n t e r c e p t i o n

**THE REMEDIATOR®**  
Grease Treatment System



P.O. Box 3237  
Montgomery,  
AL 36109-0237  
Tel: 334-277-8520  
Fax: 334-272-7396  
[www.jrsmith.com](http://www.jrsmith.com)



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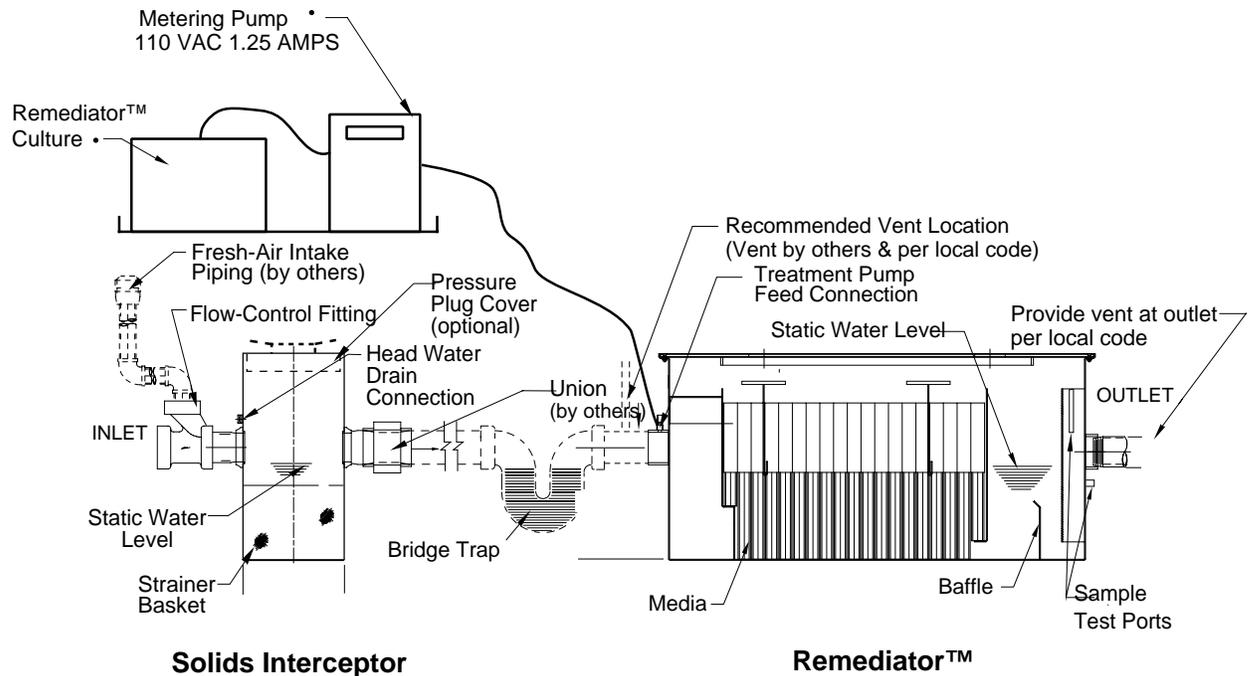
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## Remediator™ JRS Fig. 8970





# GENERAL OVERVIEW OF THE JAY R. SMITH REMEDIATOR™ THE GREASE TREATMENT SYSTEM

*An Environmentally Safe Choice for Grease-free Waste Water*



## **An Environmentally Safe Choice**

Food service establishments and industrial processing facilities generate fat, oil, grease, sugar and other contaminants in waste water. Fat, oil and grease are major contributors to blockage and backups in interior drainage systems and city mains, often causing unpleasant odors, costly pumping of interceptors and, in extreme cases, excavation of drains, traps and mains. Enzymes, caustic compounds (lye), detergents, and hot water temporarily liquefy and transport the contaminants down-stream, but the additives become diluted and the water soon cools, allowing coagulation, resulting in blockage and backup. The goal is complete eradication of suspended fat, oil and grease (FOG) at the source.

The Remediator™ Grease Treatment System is designed to accomplish this task through the use of environmentally safe live bacteria (we call Remediator™ Culture) which have been specially selected and bred to have broad appetites to digest fat, oil, grease, sugar, and starch and other complex carbohydrates and proteins.

## **The Remediator™ unique grease treatment process consists of the following:**

1. separation and retention of over 99% of suspended fat, oil and grease;

2. uniform and regular application of multi-strain live bacteria (Remediator™ Culture) to establish and maintain a biofilm of the greatest possible area and vitality;
3. disposal of FOG by metabolic processes of the organisms inhabiting the biofilm; and
4. removal of over 90% of the suspended solids over 2mm from the waste water stream with the custom designed solids interceptor.

Remediator™ Culture includes nine different strains of natural bacteria which are non-toxic and non-pathogenic. They have been specifically selected and bred for the Remediator™ Grease Treatment System to assist degradation of cellulose, and digest fat, oil, grease and sugar. Remediator™ Culture consists of selected beneficial strains of Bacillus, Pseudomonas, Arthobacter, and Micrococcus bacteria.

The Remediator™ Grease Treatment System is designed specifically to provide the greatest possible surface area incorporating an interactive media on which the biofilm is maintained. Through applied hydrodynamics, the media separates and retains material in the effluent and transfers it to the biofilm within the interactive media.

## **Complete Elimination Through Bioremediation:**

The Remediator™ Grease Treatment System incorporates the following three essential elements to complete elimination through bioremediation:

1. redirecting of effluent, allowing effective separation and retention of the fat, oil and grease, while ensuring contact with the biofilm, so the bacteria can consume it;
2. allowing controlled drainage without permitting flow-through of undigested solids; and
3. maintaining an enhanced environment so live, fully germinated bacteria can perform as designed.

This easy-to-install system is obviously the most reasonable solution to the problem of grease pollution.



# FEATURES AND BENEFITS OF THE THE JAY R. SMITH REMEDIATOR™ GREASE TREATMENT SYSTEM

## Features

### Remediator™ Grease Treatment System

#### The most advanced method of eliminating grease from waste discharge.

- The Remediator™ system is designed to use a liquid mixture of nine species of non-pathogenic, environmentally safe, bio-film building bacteria referred to as Remediator™ Culture which digests the fat, oil and grease (FOG), thereby eliminating an accumulation or potential blockage in the drainage system.
- Maintenance costs are virtually non-existent with no moving parts to service and no periodic clean out of fat, oil and grease.

- **No Dipping**
- **No Hauling cost**
- **No Drawing-off**
- **No Grease**

- The Remediator™ vertical vortex media (patent pending) provides a large surface area to facilitate separation and retention of FOG to allow consumption by the Remediator™ Culture.
- This system is regularly furnished with a stainless steel solids interceptor which separates out large food scraps and particles prior to entering the Remediator™.
- The Remediator™ comes standard with two sampling ports, internal and external. Sampling of the effluent is encouraged to assure water quality requirements are being met and the system is functioning correctly.

*What other grease interceptor system encourages you to measure performance?*

## Benefits over other types of grease interceptors

Other Units	Benefits of the Remediator™
<p><b>Typical, indoor or in-ground, steel G.Is</b> —If the user must comply with a code which limits grease to 100 parts per million, cleaning would be recommended every 2 to 3 days.</p>	<p><b>The Remediator™ literally eradicates FOG from the effluent by the use of Remediator™ Culture with a discharge tested to below 100 parts per million.</b> The unit, depending on use, only requires removal of non-grease material once or twice a year.</p>
<p><b>Timer controlled Grease Recovery Device (GRD)</b> —Typically utilize a disk or belt which passes through the FOG layer and a squeegee device to wipe the accumulated FOG from the disk or belt into a drain trough and into a FOG receptacle.</p>	<p><b>The Remediator™ has no moving parts</b> and the Remediator Culture digests the FOG thereby eliminating an accumulation or potential blockage in the drainage system.</p>
<p><b>Sensor controlled Grease Recovery Device (GRD)</b> —These devices have the ability to sense the presence of FOG. By detecting FOG and initiating the removal process only when necessary, GRD eliminate the daily routine of GI cleaning. However, these devices do require periodic maintenance to remove trapped solid debris and removal of scum and there is the continuing problem of recovered grease disposal. These devices also require electrical connections and components.</p>	<p><b>The Remediator™ system is regularly furnished with a solids interceptor</b> which separates out large food scraps and particles. The solids interceptor basket is the only ongoing maintenance required. It should be emptied once a day, or more frequently if needed. The Remediator Culture digests the FOG, thereby eliminating an accumulation or potential blockage in the drainage system. <b>The only electrical connection for the Remediator™ is the standard 110 volt Culture Metering Device.</b></p>
<p><b>Large capacity in-ground, concrete GIs</b> —These units are usually installed in the parking lot, outside, requiring additional cost for extra piping, access parts and periodic pumping. Their location outside goes against the recommended practice to locate the interceptor as near as possible to the source of the FOG laden water. This is important because every foot of piping between the source of FOG laden waste water and the interceptor is unprotected and is a potential maintenance problem</p>	<p><b>The Remediator™ is installed inside</b> as close as possible to the last source of the FOG laden water.</p>



# ELIMINATE FAT, OIL AND GREASE, AND MOST OF THE ASSOCIATED PROBLEMS— REMIANIATOR™ GREASE TREATMENT SYSTEM ISOMETRIC OVERVIEW

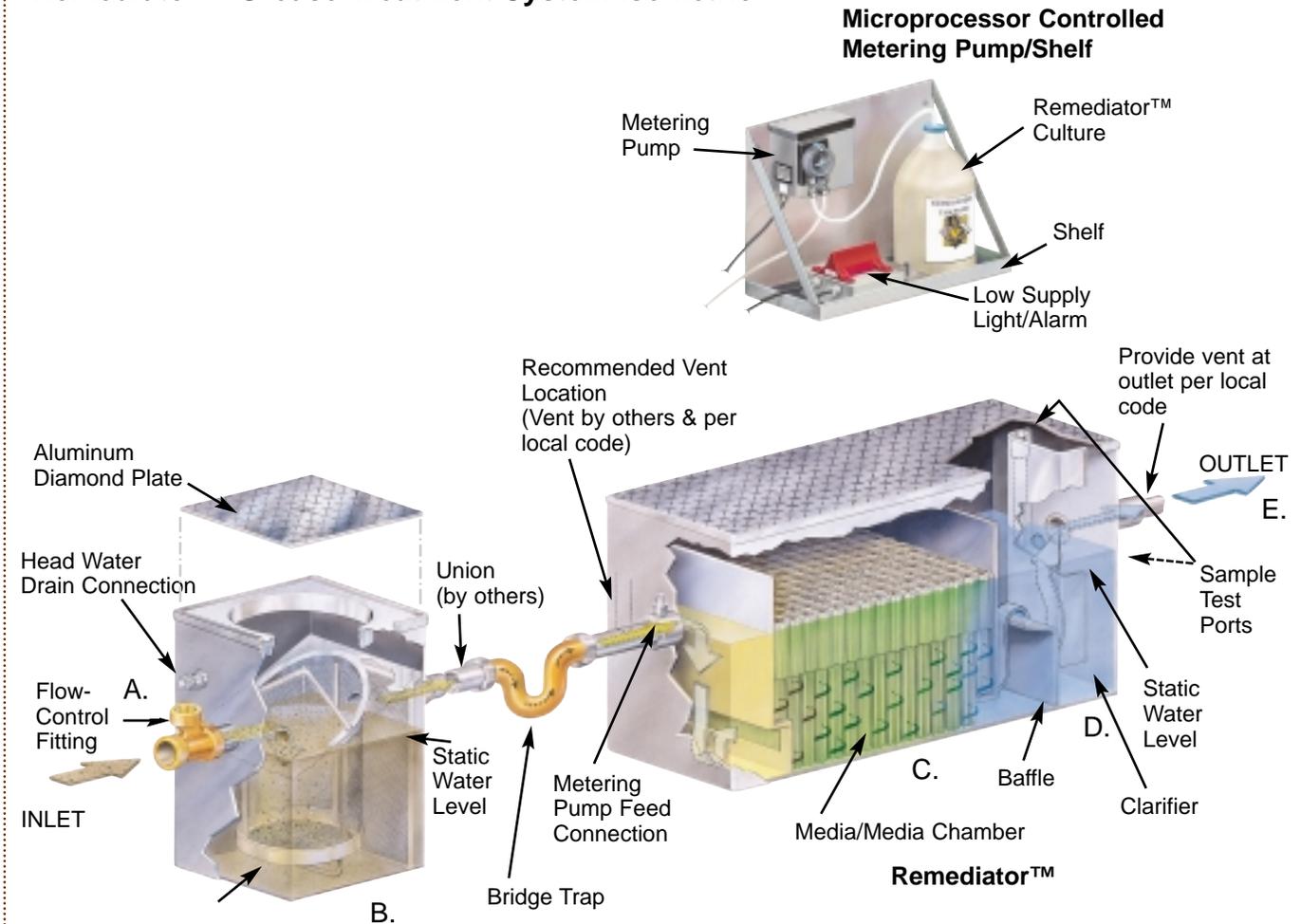
## How the Remediator™ Grease Treatment System Works

The influent first enters the solids interceptor via a flow control fitting (A) that assures a proper rate of flow as well as oxygen introduction. The solids interceptor (B) retains food scraps and particles. The flow exits the solids interceptor and enters the Remediator's primary chamber where it is evenly metered to the media chamber (C) where separation is effected by conventional gravity method and vortex-induced coalescence. The flow passes through the media which is engineered to create vortices which cause less dense materials (FOG) to rise along the vertical

surfaces of the media structure where they come in contact with the micro-organisms inhabiting the biofilm.

As the grease collects on the biofilm, the bacteria secrete lipases, which break the bonds between the fatty acids and glycerols. The bacteria are then able to digest FOG, giving off residual byproducts of carbon dioxide and water. The drainage continues through the media chamber to the clarifier (D) and is channeled to the outlet (E) where it can be piped to the sanitary sewer system.

## The Jay R. Smith Mfg. Co. Fig. 8970 Remediator™ Grease Treatment System Isometric





## THE REMEDIATOR™ SYSTEM: ENGINEERED COMPONENTS WORKING TOGETHER TO ERADICATE FOG

### What the Remediator™ Grease Treatment System does to FOG.

Fats are widely distributed in nature and are used for fuel, lubricants, and as the starting products for other compounds. The chemical structures of fats are quite complex due to the many combinations possible as fatty acid groups attached to glycerol "backbones." Plant seed fats present up to 1,000 different fatty acid-glycerol combinations while animal fats may produce over 60,000. This helps explain why animal fats often are more difficult to degrade than vegetable fats.

Fats and oils assimilated within the biofilm are hydrolyzed by enzymes (biological catalysts) called lipases. Certain bacteria are capable of producing various lipases and are key to the bio-degradation processes. Once the fatty acids and glycerols have been separated, a host of other bacteria are ready to continue the catabolic process which leads to the oxidation of lipids into carbon dioxide and water.

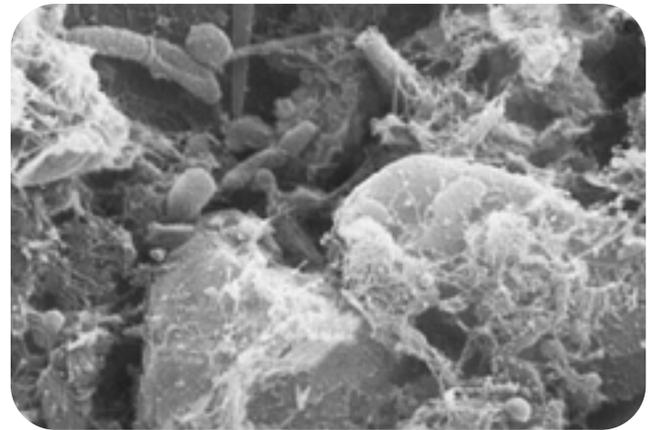
### The Remediator™ Culture

The bacteria used in the Remediator™, we call Remediator Culture, are naturally occurring bacteria species. The bacteria adhere to the large surface area of the media both above and below the static water level of the Remediator™ Grease Treatment System. These micro-organisms form a controllable biological ecosystem called a biofilm. As the effluent surges into the Remediator™, the fat, oil, and grease and other nutrients are brought into contact with the biofilm where the bacteria digests the waste, releasing carbon dioxide and water.

The Remediator™ Culture is totally non-pathogenic (does not cause infections) and is safe to humans. The bacteria that comprise Remediator™ Culture can be found in our digestive tracts, some are present in any tap-water source, one is present in the gut of a termite and some are found in soil.

The Remediator™ Culture multiply by cell division. Each ounce of Remediator™ Culture contains approximately 5.5 billion colony-forming units that develop and maintain a healthy biofilm in the media chamber. The bacteria multiply approximately 50,000 times in 24 hours,

enabling rapid elimination of fat, oil, grease, sugar and starch. Individual cell life is approximately 20 minutes in free or planktonic state. However, cell life is extended somewhat in the protection of a biofilm, or in conditions of lower temperature or reduced food availability.

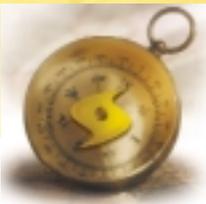


*The photo above shows a naturally occurring biofilm from a septic system, similar to the biofilm found in the Remediator™.*

### The benefits of bacteria and its use with the Remediator

Beneficial use of microorganisms such as yeast and bacteria touches virtually every aspect of our day to day lives. Perhaps the most common uses of bacteria are in the production of antibiotics, amino acids, citric acid and vitamins. These items are used by nearly everyone daily in one form or another as medicines, dietary supplements, flavorings and preservatives. These products and the products they enhance would not be possible without the use of beneficial organisms. Active use of micro-organisms is essential to brewing, dairy, baking, fruit and vegetable processing, sugar and starch production as well.

The most fundamental and most critical function of bacteria in our lives is at the very basis of life on the planet earth. The availability of the building blocks of life: carbon, nitrogen and oxygen is the direct result of bacterial action. Free atmospheric oxygen is the by-product of mineral eating stramatolytes; the nitrogen cycle which provides the majority of our atmosphere requires the activity of nitrifying and nitrogen

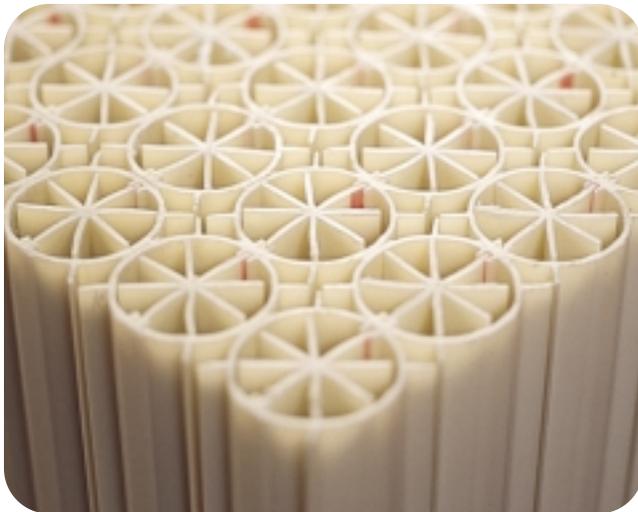


## BENEFITS OF REMEDIATOR™ MEDIA, METERING DEVICE, AND SOLIDS INTERCEPTOR

releasing bacteria; carbon, the substance of all life on earth is recycled only by bacteria or fire.

People rarely know or appreciate the dependence of their very existence on the lowly bacteria.

*The photo below shows a portion of the 2,128 cells in the media (patent pending) on which the Remediator™ Culture bacteria affix themselves to form the biofilm. The configuration of cells is designed to create small vortices in the wastewater flow, causing the grease to rise to the surface. All separated and retained grease is digested from the waste stream.*



### The Remediator™ Media

The Remediator™ Media which is at the center of the treatment process provides a large surface area that is essential in the separation and retention of FOG by the Remediator™. The surface area in the honeycomb of cells comprising the media would cover the first five yards of a football field—it is where the Remediator™ Culture does its job. Without the media, the bacteria would be washed downstream rendering the unit's treatment function ineffective.



### The Remediator™ Culture Metering Device.

To maintain the biofilm, the bacteria require some time to attach to the media surfaces so

the replenishment of the Remediator™ Culture takes place during a period of relative inactivity rather than at times of maximum use. The bacteria, being live, fully vegetative organisms, require no further incubation period to become productive. In normal operation, 1 oz. of the Remediator™ Culture is prescheduled for injection into the Remediator™ every 24 hours, during a period of low kitchen activity.

### The benefits of the Remediator™ solids Interceptor

The Remediator™ is designed to separate, retain and dispose of FOG; a liquid pollutant which is not efficiently separated, retained or easily disposed of by gravity interceptors. Solid material is not a liquid pollutant and is easily disposed of. The system features which make the Remediator™ extremely efficient at separating and retaining liquid pollutants make it extremely efficient at separating and retaining solids, a pollutant the Remediator™ is not designed to digest. Solids require much longer to break down in a biofilm and will accumulate over time eventually causing odor and partial or complete blockage of the unit, which is why a solids interceptor is included.

The solids interceptor is an inline separator with an easily removable basket-style strainer designed to remove all suspended solids over 2mm. It is fitted with a permanent safety screen to ensure no solids bypass during emptying of or inattention to the basket.



Company testing verifies the strainer is capable of handling all designated flows with capacity for normal solids accumulation at an efficiency in excess of 99%. A benefit, in addition to dependable operation of the Remediator™, is over 99% reduction in TSS (Total Suspended Solids) and concurrent reduction in BOD (Biological Oxygen Demand) loading from kitchen waste to the POTW (Publicly Owned Treatment Works) or septic system.



# REMIANIATOR™ GREASE TREATMENT SYSTEM GUIDE SPECIFICATIONS AND APPROVALS

## Remediator™ Grease Treatment System Guide Specifications

The Jay R. Smith Remediator™ system is the most advanced and effective method of eliminating grease from grease-laden waste water discharge. The Remediator™ provides users the opportunity to upgrade the quality of their waste water discharge to meet regulatory requirements and to reduce operating and maintenance costs. The unit consists of no moving parts, and is designed to require removal of non-grease material only once or twice a year.

The Remediator™ system is specifically designed to separate fat, oil, and grease from water and retain them in a specially designed structure which maximizes vertical surface area. There, the grease is retained and digested by the biofilm, releasing only carbon dioxide and water.

## Suggested Engineers Specifications- Figure 8970

**Project Specifications:** Grease Treatment System shall be as manufactured by Jay R. Smith Mfg. Co., 2781 Gunter Park Drive East, Montgomery, AL 36109-1405 and as noted in the contract documents.

## Grease Treatment System Specifications:

Furnish and install a Jay R. Smith figure 8970 Series Remediator™ fat, oil and grease (FOG) internal disposal and treatment system with a \_\_\_ GPM flow rating and grease capacity of \_\_\_ lbs (Refer to Smith's sizing criteria and select a 20, 35, 50, or 75 GPM unit). The unit shall be constructed from stainless steel with aluminum diamond plate cover and be furnished complete with vertical vortex media, micro-processor controlled metering pump with low supply alarm, external flow control fitting, bridge trap and Culture reservoir. The main intercepting unit shall be manufactured with integral internal and external test ports. The system shall include a stainless steel solids interceptor with a stainless steel mesh lined basket for disposal

of solids. The solids interceptor shall also be provided with a stainless steel mesh lining on the outlet. The system shall be tested and certified by the Plumbing and Drainage Institute as being in conformance with Standard PDI-G101. Where jurisdiction applies, the system shall be listed by an accredited listing agency as a FOG INTERNAL DISPOSAL SYSTEM, certified by independent, accredited laboratory testing as releasing less than 100 mg/L FOG. An alternative system must include each of the specified features and documented test results.

## Options

### 1.-E, Stainless Steel Extension for the Remediator™ and Solids Interceptor

Extension provides additional roughing in depth from the top of the Remediator™ to the center line of inlet and outlet.

### 2.-PP, Pressure Plug for Solids Interceptor in Lieu of Flat Cover

Pressure plug cover for stainless steel solids interceptor to replace loose set cover in remote placement or significant head pressure applications.

### 3.-B, Stainless Steel Basket for Solids Interceptor

Extra solids interceptor basket available for continuous operations.

## Approvals: Listings for the Remediator™

- P.D.I. Certification to PDI-G101
- IAPMO Listed, File No. 3782
- Approved by the City of Chicago Plumbing Code
- Approved by the County Sanitation Districts of Los Angeles County
- Approved by the Wisconsin Department of Commerce in Compliance with Wisconsin Statutes and Administrative Code.
- City of Spokane - Department of Wastewater Management authorizes the installation of the Remediator™ for the control/removal of food preparation FOG prior to discharge.



# MAINTENANCE AND COST OF THE REMEDIATOR™ COMPARED TO LARGE CAPACITY IN-GROUND TYPE INTERCEPTORS

## Maintenance of the Remediator™ compared to large capacity in-ground type interceptors

The cleaning/pumping frequency for large capacity in-ground type interceptors, typically made of concrete is in the range of 2 to 4 weeks. The maintenance on the Remediator™ is done daily with the injection of Remediator™ Culture. Due to the nature of the large capacity interceptors, the user is not likely to be the cleaner/pumper, and in some cases may actually be prohibited from cleaning/pumping the interceptor. Usually cleaning/pumping will be done by a septic tank service, or an interceptor cleaning service. The annual cost of regular cleaning/pumping is likely to average between \$2,800 and \$4,000 depending again upon the discharge limits and the local market costs.

In contrast, the Remediator™ can be maintained by the owner. On average, the Remediator™ Culture will have to be replaced once every

four months and once or twice a year, remove any non-grease accumulation. That's it! (See Remediator™ Installation, Operation and Troubleshooting Guide, PM 0222, for details.) The monthly cost of maintaining the Remediator™ is about \$50. See cost comparison below for analysis of the Remediator™ versus in-ground, exterior interceptor.

According to PDI 15d, "the biggest obstacles to regular maintenance on large capacity grease interceptors has been the odors usually associated with interceptors. The easiest way to eliminate that problem is frequent cleaning."

The Remediator eliminates the odor problem because the Remediator™ Culture digest FOG continuously, which means there is no grease standing in the interceptor which may go rancid. In addition, the solids are screened out of the waste water by the solids interceptor eliminating the risk of having putrefied odors.

## Large Capacity, in-ground, concrete GI's vs Remediator™ System

The pumping and disposal fees associated with large capacity, in-ground, concrete 1,000 gallon capacity, grease interceptors will average between \$200 and \$500 per month, while a 35GPM Remediator system's operational cost should not exceed \$50.

### Initial purchase and Installation Cost:

Remediator™ System Cost \$ \_\_\_\_\_  
 In-ground, concrete G.I. cost — \$ \_\_\_\_\_

Net Difference \$ \_\_\_\_\_

### Monthly costs:

Pumping and disposal fees for in-ground, concrete G.I. \$ \_\_\_\_\_

Remediator culture and Operational Costs — \$ \_\_\_\_\_

Monthly Savings \$ \_\_\_\_\_

Net Difference \$ \_\_\_\_\_ ÷ Monthly Savings \$ \_\_\_\_\_ = Months to Equal Cost Difference \_\_\_\_\_.

For Example:

Remediator™ System Costs \$6,000  
 In-ground, concrete GI cost - \$5,000  
 Net Difference \$1,000

Monthly Pumping/Disposal Costs \$350  
 Monthly Cost of Remediator™ Culture - \$50  
 Monthly savings would be \$300

Net Difference (\$1,000) ÷ Monthly Savings (\$300) = 3.3 months to equal cost difference.

**Note: Using this same example, the Remediator™ system would actually pay for itself in savings after 20 months (\$6,000 ÷ 300), and then becomes a dividend paying asset.**

*Your cost, monthly savings and cost recovery period may vary from the example. This example is for illustration purposes only.*



## FREQUENTLY ASKED QUESTIONS

### **Q. How does this product differ from existing grease interceptors?**

**A.** It separates FOG at a higher efficiency than typical, indoor or in-ground, steel, grease interceptors, or large capacity, inground concrete grease interceptors; in addition, it disposes of the pollutant by internally digesting it, eliminating the need for regularly cleaning or pumping out.

### **Q. How is that possible?**

**A.** The grease is separated by gravity and coalescence and retained by a specially designed “vertical vortex media” (patent pending). The retained material is adsorbed and digested by a biological structure called a “biofilm” comprised of specially grown, totally non-pathogenic micro-organisms (we call Remediator Culture) attached to the media, releasing CO<sub>2</sub> and water. Wastewater treatment plants use a similar technology for nitrogen compounds.

### **Q. How much culture do I use and how do I introduce it into the unit?**

**A.** The unit is regularly furnished with a metering pump that meters one (1) ounce of Remediator Culture per day into the unit usually at the beginning of a quiet period in the kitchen. This cycle is preset at the factory, the operator’s only task being to replenish the one-gallon culture bottle, every four (4) months. When the level of culture in the bottle diminishes below a 10-day supply, a strobe light (regularly furnished) will alert the kitchen operator.

### **Q. How much grease can the microorganisms digest?**

**A.** The Remediator is designed to handle average loadings found in kitchens (usually between 400 mg/L-2900 mg/L fat, oil and grease in the wastewater); discharging between 15-40 mg/L FOG in the effluent. Testing has been documented with efficiencies below 15 mg/L.

### **Q. What happens to the bacteria if I use kitchen cleaners and bleaches?**

**A.** The action will not have a damaging effect since bacteria live in a biofilm structure pretty much like an ant or bee colony. Therefore, only the outer layer will suffer as a result of chemical agents’ presence and not the whole colony.

### **Q. How does the cost of this unit compare to the existing devices?**

**A.** The cost of the Remediator™ Culture is usually around \$1.50-\$1.75 per day. Eliminating the pumping and disposal costs, your monthly savings can average around \$300.

### **Q. How much maintenance do I have to do?**

**A.** You will have to empty the solids interceptor basket (provided with unit) on a daily basis, or more often as dictated by kitchen activity. When you replace the Remediator™ Culture bottle, once every four months, we recommend a visual inspection to check for silt accumulation. Discharge of floor drain waste into the drainage system and through the unit, where permitted by code, can cause silt.

### **Q. What is the biggest threat for bacteria?**

**A.** Do not allow the Remediator™ Culture to freeze! Optimal temperature range for the Remediator system are from 50-140° F, with 98° F being ideal. Make sure the perforated cap for the Culture reservoir, provided with the system, is in place; airborne carbon can prematurely activate the bacteria.



# SIZING PROCEDURE

This section gives an example of sizing procedures only. All sizing, placement and installation determinations must be performed by qualified Jay R. Smith Mfg. Co. Representatives only.

## SIZING PROCEDURE

Proper sizing (utilizing each step of the guide) is essential to handling expected loading. However, some judgement must be exercised in the process. For example, if the sizing produces a gpm rating very close to one of the design sizes, going up to the next size would be advisable to avoid problems if fixtures are added in the future, or if kitchen pollution management practices are not of the highest quality.

The seven steps outlined in the SIZING PROCEDURE guideline are self explanatory and when followed conscientiously will result in proper sizing for the application.

### SIZING PROCEDURE

1. COUNT ALL contributing fixtures, measure and calculate capacities as follows:

Rinse Sinks

( ) \_\_\_\_\_ W X \_\_\_\_\_ L X \_\_\_\_\_ D= \_\_\_\_\_ Cu.In. ÷ 231= \_\_\_\_\_ gals.  
 ( ) \_\_\_\_\_ W X \_\_\_\_\_ L X \_\_\_\_\_ D= \_\_\_\_\_ Cu.In. ÷ 231= \_\_\_\_\_ gals.  
 ( ) \_\_\_\_\_ W X \_\_\_\_\_ L X \_\_\_\_\_ D= \_\_\_\_\_ Cu.In. ÷ 231= \_\_\_\_\_ gals.  
 ( ) \_\_\_\_\_ W X \_\_\_\_\_ L X \_\_\_\_\_ D= \_\_\_\_\_ Cu.In. ÷ 231= \_\_\_\_\_ gals.

Pot Tubs

( ) \_\_\_\_\_ W X \_\_\_\_\_ L X \_\_\_\_\_ D= \_\_\_\_\_ Cu.In. ÷ 231= \_\_\_\_\_ gals.  
 ( ) \_\_\_\_\_ W X \_\_\_\_\_ L X \_\_\_\_\_ D= \_\_\_\_\_ Cu.In. ÷ 231= \_\_\_\_\_ gals.

Svc. Sinks

( ) \_\_\_\_\_ W X \_\_\_\_\_ L X \_\_\_\_\_ D= \_\_\_\_\_ Cu.In. ÷ 231= \_\_\_\_\_ gals.

**1-A. TOTAL= \_\_\_\_\_ gals.**

2. \_\_\_\_\_ Total gallons from 1-A X .75 (fill factor) ÷ 2 minute drain down period = \_\_\_\_\_ GPM

3. \_\_\_\_\_ Number of Floor Sinks (Except Indirect Wastes from above) X 4.0 \_\_\_\_\_ GPM

4. \_\_\_\_\_ Number of Misc. Kettle Lines, etc. at capacity or at  
 Manufacturer's rated discharge \_\_\_\_\_ GPM

5. \_\_\_\_\_ Dishwasher: Manufacturer's Peak Rate of Drain Flow \_\_\_\_\_ GPM (Initial rate  
 with full tank Request from manufacturer) = \_\_\_\_\_ GPM  
 = \_\_\_\_\_ gal / hr. / 60 = \_\_\_\_\_ gpm

**5-A. Alternative method for figuring dishwasher flow rate if actual peak rate of drain flow is unknown:**

Dishwasher: Manufacturer's Rated Consumption per cycle:  
 \_\_\_\_\_ gals. x \_\_\_\_\_ cycles per hour = \_\_\_\_\_ gals. per hour ÷ 60 = \_\_\_\_\_ GPM

6. Specialized Equipment: \_\_\_\_\_ with discharge at: \_\_\_\_\_ GPM

**6-A. TOTAL ( add 2, 3, 4, 5 & 6)= \_\_\_\_\_ GPM**

### 7. LOADING INFLUENCES:

MENU: Italian & Oriental- \_\_\_\_\_ total GPM (from 6-A) x .25 (25%) = \_\_\_\_\_ GPM

HOURS: 24 hours operation \_\_\_\_\_ total GPM (from 6-A) x .25 (25%) = \_\_\_\_\_ GPM

**ADJUSTED TOTAL GPM (6-A & 7) = \_\_\_\_\_ GPM**

Note: Steps 1 & 2 are standard PDI G101 sizing criteria.

Select Remediator™ System, figure number 8970-20 (20GPM), -35 (35GPM), -50 (50GPM), or -75 (75GPM), whichever most closely corresponds to flow rate calculated. Sizing and proper installation of the Remediator™ and use of Remediator™ Culture are crucial to its optimal functioning. See the Remediator™ Installation & Operation Troubleshooting Guide PM0222 for complete procedures and site checklist.

# THE REMEDIATOR®



Contact your local representative



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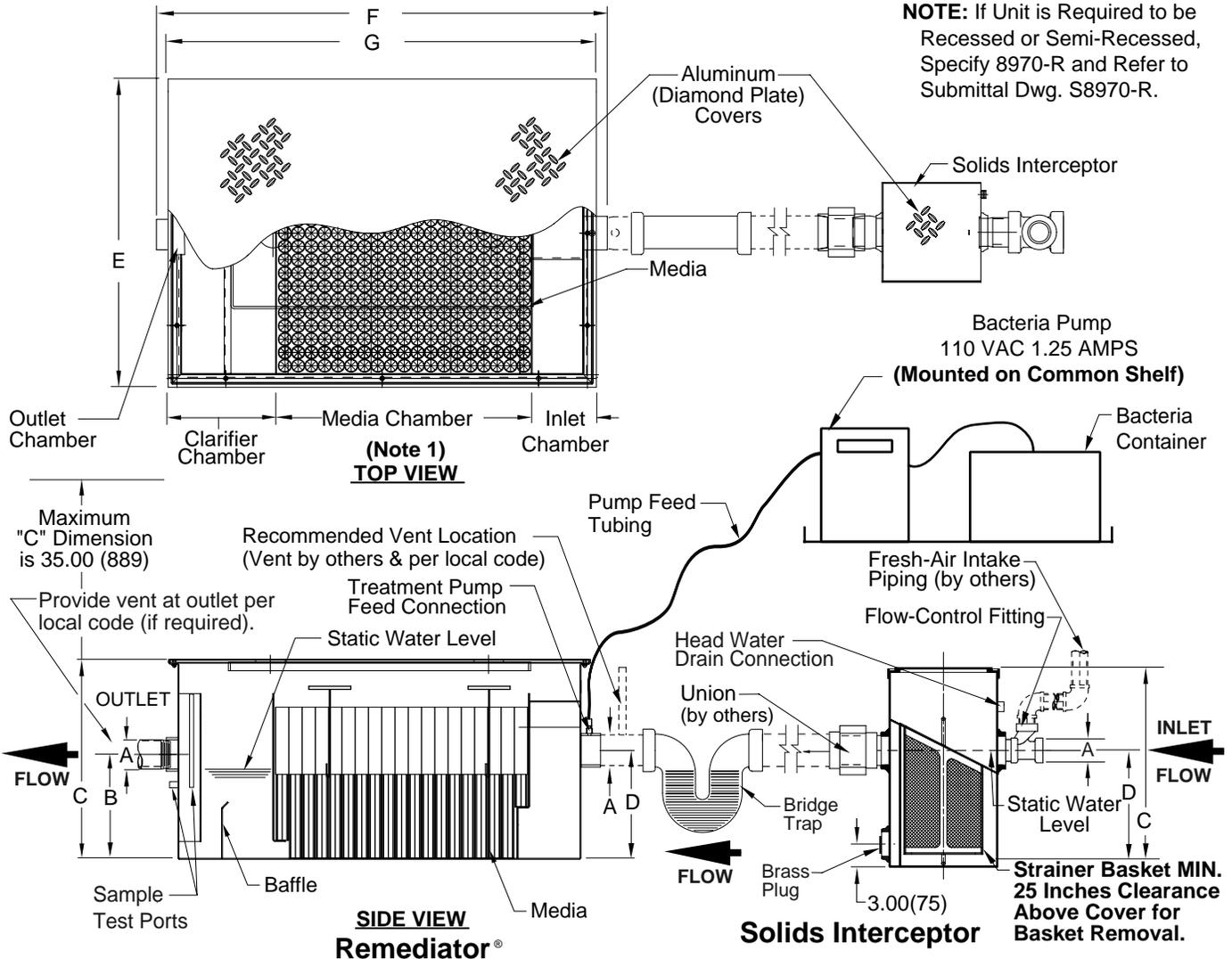
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LOCATION

# REMIATOR® GREASE TREATMENT SYSTEM

**FUNCTION:** The Smith Remediator® is designed to be installed in the drainage plumbing of commercial and institutional facilities for the purpose of intercepting, separating, retaining and biologically disposing of grease, oil and other organic and inorganic material, not including human waste, contained in effluent of such facilities.



Maximum "C" Dimension is 35.00 (889)

Provide vent at outlet per local code (if required).

Recommended Vent Location (Vent by others & per local code)

Treatment Pump Feed Connection

Static Water Level

OUTLET

FLOW

A

B

C

Sample Test Ports

Baffle

Media

**SIDE VIEW**  
**Remediator®**

Pump Feed Tubing

Head Water Drain Connection

Union (by others)

Bridge Trap

Brass Plug

FLOW

A

D

3.00(75)

**Solids Interceptor**

Fresh-Air Intake Piping (by others)

Flow-Control Fitting

Static Water Level

INLET

A

D

C

PART NO.	GPM	A	B	C	D	E	F	G	No. of Sections per media
▲ ▲ * 8970-20	20	02" (50)	12.00 (305)	21.31 (541)	12.50 (320)	14.88 (378)	44.12 (1120)	42.125 (1070)	1
▲ ▲ * 8970-35	35	02" (50)	12.00 (305)	21.31 (541)	12.50 (320)	24.43 (621)	52.20 (1326)	49.75 (1265)	1
▲ ▲ * 8970-50	50	03" (75)	12.50 (320)	21.31 (541)	13.00 (330)	30.50 (775)	52.20 (1326)	49.75 (1265)	3
▲ ▲ * 8970-75	75	03" (75)	12.50 (320)	21.31 (541)	13.00 (330)	35.50 (900)	52.20 (1326)	49.75 (1265)	3

**NOTE 1:** The 8970-50 and 8970-75 Media is Divided into Multiple Sections - See Chart Above.

**NOTE 2:** Bridge Trap Only Available in 2" and 3" Sizes. 4" Not Available.

**REGULARLY FURNISHED:**

Stainless Steel Pretreatment Unit with Media and Biological Treatment  
 Pump with Preset Timer. Stainless Steel Solids Interceptor with Aluminum (Diamond Plate) Cover, Cast Iron Bridge Trap and Cast Iron Flow-Control Fitting.

**VARIATIONS:**

Pressure Plug Cover For Solids Interceptor

\* P.D.I. Certification to PDI-G101.

▲ IAPMO Listed. File No. 3782

△ NES listed PCR GI 101.012

**NOTE:** Dimensions shown in parentheses are in millimeters.

REV.	DATE	DESCRIPTION	BY	CKD. BY
W	4-24-03	Added new "Note"	RN	WAS
V	4-15-03	Added Low Outlet, removed Pressure Plug Cover	TBW	WAS
U	11/18/02	Updated Layout, Interceptor	JJ	WAS

WEIGHT POUNDS	VOLUME CUBIC FEET	FIGURE NUMBER
		<b>8970</b>

DRAWING NUMBER  
S8970

SIZE  
A

SCALE:  
NONE

DATE:  
6-25-96

APPROVED BY:  
SB

CHECKED BY:  
WAS

DRAWN BY:  
EMB

**8970**

FIGURE NUMBER

DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCE AND CHANGE WITHOUT NOTICE

WE CAN ASSUME NO RESPONSIBILITY FOR USE OF SUPERSEDED OR VOID DATA

# INTERCEPTING PRETREATMENT UNIT REMIANIATOR®

## INSTALLATION PROCEDURES

**PLACEMENT:** The Remediator® may be installed with either a right or left inlet by simply reversing the orientation of the unit. In determining the location of the unit relative to the piping layout at the site, observe the following:

1. The Remediator® should be installed at the closest available location downstream of the last contributing fixture before intersection with any blackwater piping.
2. That location in the piping layout which satisfies Item (1), should provide reasonable access for inspection and service as well as access to the solids strainer for ease of solids removal.
3. Provision for routing air to the air-injecting 8000 series flow control is mandatory and shall be accomplished per the requirements of the applicable Local Plumbing Code. (The Jay R. Smith Mfg. 8000 Series Flow Control Fitting with the appropriate orifice size is included in the Remediator® package). Normal venting in compliance with Local Plumbing Codes is sufficient for average installations.
4. The bridge trap furnished with the system must be installed to ensure proper functioning of the system.

**PLUMBING:** THE ORDER OF FLOW IS: (LAST CONTRIBUTING FIXT.) → (FLOW CONTROL) → (SOLIDS INTERCEPTOR) → (TRAP) → (VENT) → (REMIANIATOR®)  
NO DEVIATION FROM THIS ORDER IS PERMISSIBLE.

Standard PVC piping is suitable to connect the unit, utilizing conventional fittings or "no-hub" adapters at the inlet and outlet of the unit itself.

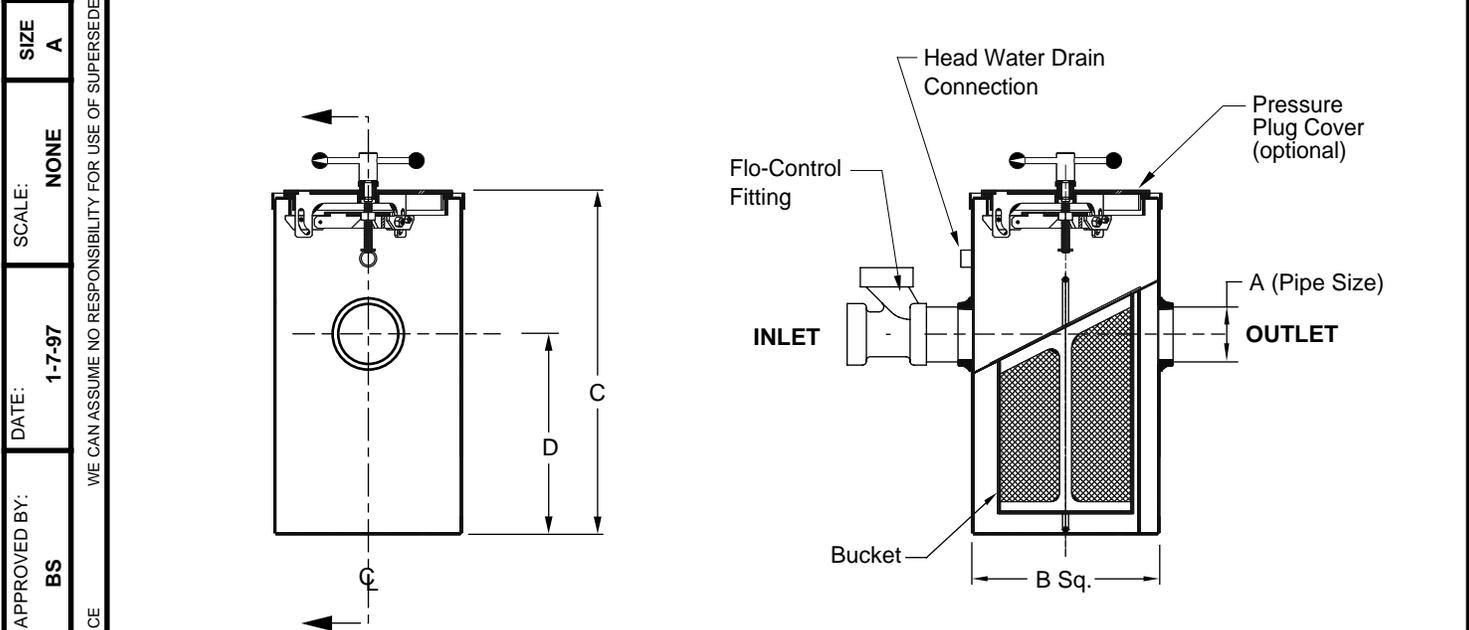
1. Place the unit on a hard level surface. Check with local Certified Installer or Health Authorities regarding raising or sealing at the base of the unit. In the event raising is required, the unit is structurally designed to allow supports to be placed at both ends of the unit. (Such supports should be of suitable strength and material.)
2. Place the air injecting flow control as close to the last contributing fixture as possible. For purposes of convenience, the solids strainer may be placed a reasonable distance from the flow control.

FIGURE NUMBER	<b>8970BS</b>	D 02-16-00 Revised Text C 04-30-99 Revised B 05-02-97 Chg'd #3, PLBG NOTE, #2 A 12-02-96 Chg'd Title	JJ CMD CMD EMB	BS BS BS	WEIGHT POUNDS	VOLUME CUBIC FEET	<b>FIGURE NUMBER</b>  <b>8970BS</b>
REV.	DATE	DESCRIPTION	BY	CKD. BY			

DRAWING NUMBER: 8970BS  
 SIZE: A  
 SCALE: NONE  
 DATE: 10-11-96  
 APPROVED BY: SB  
 CHECKED BY: SLB  
 DRAWN BY: CMD  
 DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCE AND CHANGE WITHOUT NOTICE  
 WE CAN ASSUME NO RESPONSIBILITY FOR USE OF SUPERSEDED OR VOID DATA

DRAWING NUMBER	<b>S8970-SI</b>	<h1 style="margin: 0;">REMIATOR™ SOLIDS INTERCEPTOR</h1>
----------------	-----------------	--

**FUNCTION:** To provide means of collecting various food waste solids to prevent entry into the Remediator™ Grease Treatment System. Remediator™ Solids Interceptor can be installed on the floor or recessed. Unit must be installed where access is available for regularly required maintenance.



WE CAN ASSUME NO RESPONSIBILITY FOR USE OF SUPERSEDED OR VOID DATA

APPROVED BY: BS

CHECKED BY: BS

DATE: 1-7-97

SCALE: NONE

SIZE: A

**THREADED INLET AND OUTLET**

FIGURE NO.	GPM	A (Pipe Size)	B Sq.	C	D
▲▲ 8970-SI-20	20	02 (50)	11.80 (300) SQ.	21.31 (541)	12.50 (320)
▲▲ 8970-SI-35	35	02 (50)	11.80 (300) SQ.	21.31 (541)	12.50 (320)
▲▲ 8970-SI-50	50	03 (75)	11.80 (300) SQ.	21.31 (541)	13 (330)
▲▲ 8970-SI-75	75	03 (75)	11.80 (300) SQ.	21.31 (541)	13 (330)

▲ IAPMO Listed, File #3782  
 ▲ NES Listed PCR GI 101.012

**NOTE:** Flow Control fitting must precede Solids Interceptor but shall not be installed more than 16" (405) below the centerline of the discharge of the highest contributing fixture.

**NOTE:** When using Solids Interceptor Pressure Plug, a 4" (100) Extension is Required for Recessed Installations. (See 8970-R)

**NOTE:** Minimum 25" clearance above cover for bucket removal.

**NOTE:** Dimensions shown in parentheses are in millimeters.

\*If Unit Recessed, 4" Extension is Required.

**REGULARLY FURNISHED:**  
 All Stainless Steel Fabricated Interceptor Body with Mesh Bucket and Diamond Plate Cover w/Lift Ring, and Cast Iron Flow Control Fitting.

**VARIATIONS:**  
 Pressure Plug Cover\*

**8970-SI**

FIGURE NUMBER	<b>8970-SI</b>	G F E D 11/18/02 08/21/00 07/31/00 5-21-99	Revised Text Revised Text Revised Text Revised Drawing	JJ RN JJ CMD	BS BS BS	WEIGHT POUNDS  	VOLUME CUBIC FEET  	<b>FIGURE NUMBER</b> <h1 style="margin: 0;">8970-SI</h1>	
REV.	DATE	DESCRIPTION		BY	CKD. BY				

M

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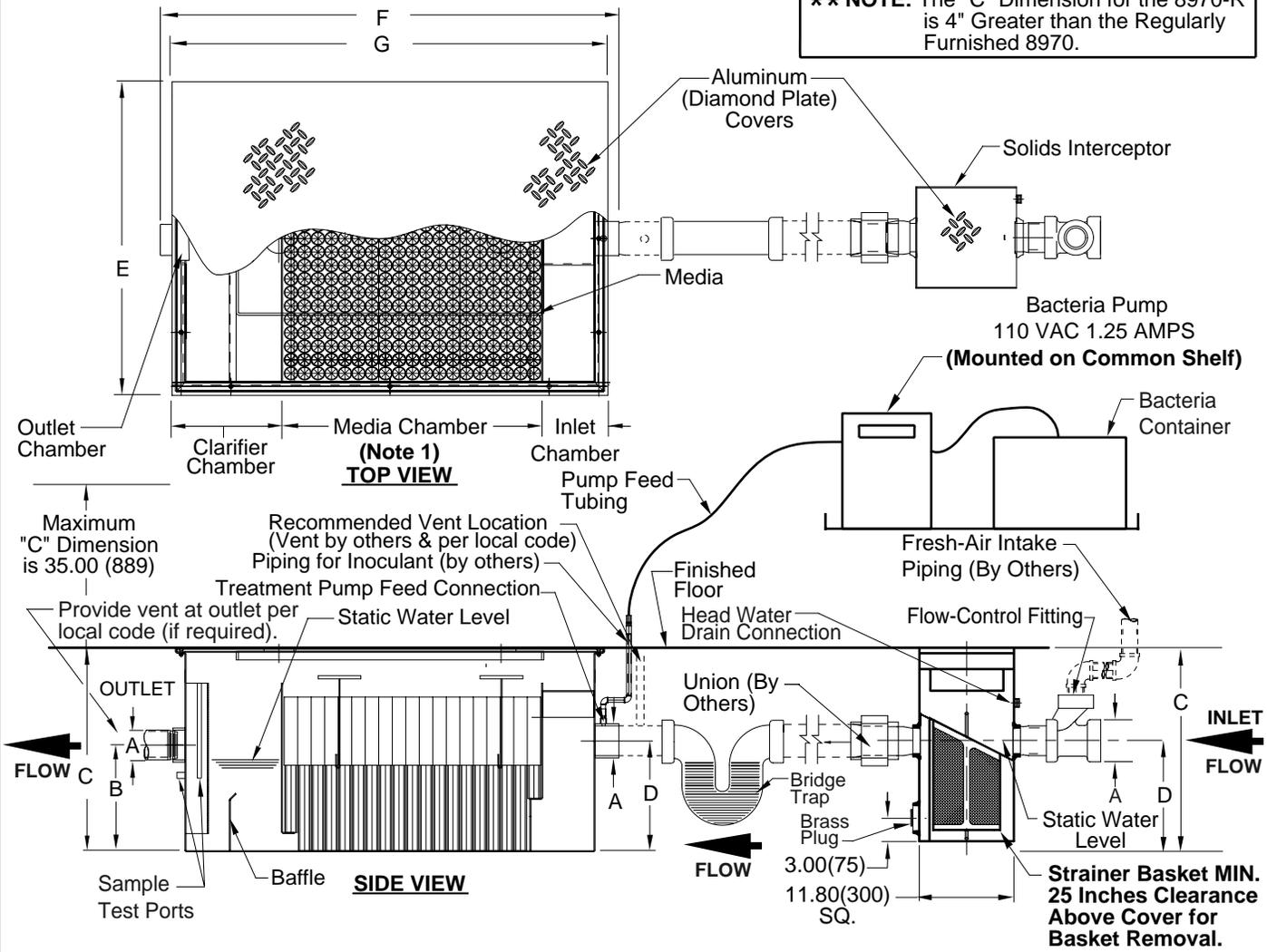


LOCATION

# REMEDIATOR® GREASE TREATMENT SYSTEM

**FUNCTION:** The Smith Remediator® is designed to be installed in the drainage plumbing of commercial and institutional facilities for the purpose of intercepting, separating, retaining and biologically disposing of grease, oil and other organic and inorganic material, not including human waste, contained in effluent of such facilities.

**\*\* NOTE:** The "C" Dimension for the 8970-R is 4" Greater than the Regularly Furnished 8970.



PART NO.	GPM	A	B	** C	D	E	F	G	No. of Sections per media
△ ▲ * 8970-20	20	02" (50)	12.00 (305)	25.31 (643)	12.50 (320)	14.88 (378)	44.12 (1120)	42.125 (1070)	1
△ ▲ * 8970-35	35	02" (50)	12.00 (305)	25.31 (643)	12.50 (320)	24.43 (621)	52.20 (1326)	49.75 (1265)	1
△ ▲ * 8970-50	50	03" (75)	12.50 (320)	25.31 (643)	13.00 (330)	30.50 (775)	52.20 (1326)	49.75 (1265)	3
8970-75	75	03" (75)	12.50 (320)	25.31 (643)	13.00 (330)	35.50 (900)	52.20 (1326)	49.75 (1265)	3

**NOTE 1:** The 8970-50 and 8970-75 Media is Divided into Multiple Sections - See Chart Above.  
**NOTE 2:** Bridge Trap Only Available in 2" and 3" Sizes. 4" Not Available.

**REGULARLY FURNISHED:**  
 Stainless Steel Pretreatment Unit with Media and Biological Treatment Pump with Preset Timer. Stainless Steel Solids Interceptor with Aluminum (Diamond Plate) Cover, Cast Iron Bridge Trap and Cast Iron Flow-Control Fitting.

**VARIATIONS:**  
 Pressure Plug Cover For Solids Interceptor

\* P.D.I. Certification to PDI-G101.  
 ▲ IAPMO Listed. File No. 3782  
 △ NES listed PCR GI 101.012

**NOTE:** Dimensions shown in parentheses are in millimeters.

M	4-24-03	Added "Box to **Note" & Dim.	RN	WAS
L	4-23-03	Added "**Note"	RN	WAS
K	4-15-03	Added Low Outlet, removed Pressure Plug Cover	TBW	WAS
REV.	DATE	DESCRIPTION	BY	CKD. BY

WEIGHT POUNDS	VOLUME CUBIC FEET	FIGURE NUMBER
		<b>8970-R</b>

DRAWING NUMBER: S8970-R  
 SIZE: A  
 SCALE: NONE  
 DATE: 1-22-99  
 APPROVED BY: WAS  
 CHECKED BY: WAS  
 DRAWN BY: CMD  
 DIMENSIONS ARE SUBJECT TO MANUFACTURER TOLERANCE AND CHANGE WITHOUT NOTICE  
 WE CAN ASSUME NO RESPONSIBILITY FOR USE OF SUPERSEDED OR VOID DATA  
**8970-R**  
 FIGURE NUMBER