



# Owner's Manual

MODEL  
EST-VL  
INSTALLATION & OPERATION  
Rev 1.00A



**CMA DISHMACHINES**  
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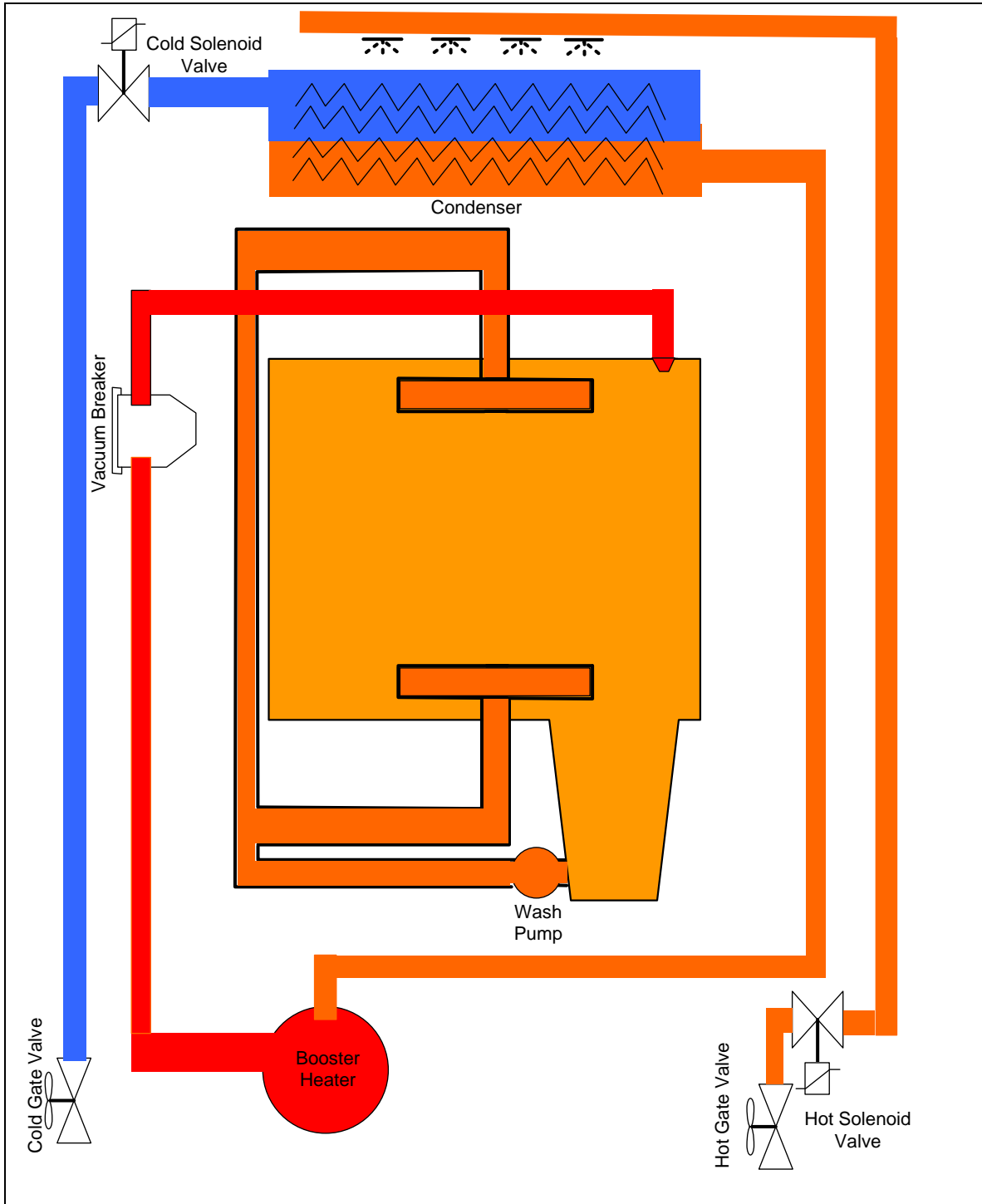
# 1. Specifications

<b>1.1 EST-VL</b>	<b>USA</b>	<b>METRIC</b>
<b>WATER CONSUMPTION</b>		
PER RACK	1.09 GAL	(4.12 L)
PER HOUR	33 GAL	(125L)
<b>OPERATING CYCLE</b>		
WASH TIME-SEC.	53	53
RINSE TIME-SEC.	30	30
DWELL TIME-SEC.	7	7
VENT FAN –SEC.	30	30
TOTAL CYCLE	120 SEC.	120 SEC.
<b>OPERATING CAPACITY</b>		
RACKS PER HOUR	30	30
WASH TANK CAPACITY	1.09 GAL.	(4.12 L)
PUMP CAPACITY	52 GPM	(196.8 LPM)
<b>WATER REQUIREMENTS</b>		
COLD WATER TEMP.	40-65°F	(5-18°C)
HOT WATER TEMP.	140°F	(60°C)
HOT WATER INLET	½"	1.27 cm
COLD WATER INLET	½"	1.27 cm
DRAIN CONNECTION	2"	5.1 cm
<b>OPERATING TEMPERATURE</b>		
REQUIRED	120°F	49°C
RECOMMENDED	140°F	60°C
<b>DIMENSIONS</b>		
DEPTH	29½"	(79.2cm)
WIDTH	25"	(64cm)
HEIGHT	85 ¼"-86 ¼"	(216-219)cm
MAX CLEARANCE FOR DISHES	20"	(43.18 cm)
STANDARD RACKS	19 ¾" x 19 ¾"	(50 x 50 cm)
MINIMUM CLEARANCE FOR FAN	6"	15.2 cm
RECOMMENDED	12"	30.4 cm
<b>ELECTRICAL RATINGS</b>		
	<b>VOLTS</b>	<b>AMPS</b>
DISHMACHINE	115 (1 phase)	16
BOOSTER HEATER	240 (3 phase)	30
WASH PUMP MOTOR	1 HP	
BOOSTER HEATER	12KW	
<b>SHIPPING WEIGHT</b>		
	400#	

## 2. Getting Started

### 2.1. Introduction to the EST-VL

#### 2.1.1. Plumbing Chart



# Getting Started

The EST-VL Dishmachine is safe and easy to operate with its “Auto Start/Stop” and it’s economical to operate—using only 1.09 gallons of water per cycle and less than 1900 watts of power when running. The EST-VL Dishmachine’s top mounted controls include built-in chemical pumps and a deliming system that assures proper chemical usage. Its integrated scrap tray prevents food soil from entering the drain system. The EST-VL can be run at a rate of 30 racks/120 covers per hour and its heavy-duty stainless steel construction assures long life and years of trouble free operation.

It is a stand-alone machine featuring a self-contained booster heater. The machine is equipped with the built in Heat Recovery System which reduces significantly the humidity in the dishwashing room. The Heat Recovery System uses the heat of the steam generated during the wash cycles to warm up the in-feed water (41F -65F) before entering the booster heater. Operation of the EST-VL is automatic. When the door is opened and then closed, the wash cycle begins automatically. To initially fill the machine daily, press auto fill rocker switch to fill the booster heater. The booster heater is full when the water begins to flow into the cabinet. Wait for about 5 minutes and press auto fill rocker switch again to fill the wash tank.

This manual is structured to provide a complete reference guide to the EST-VL Dishmachine. It is presented in a manner that all users will be able to comprehend and use as an effective tool in supporting the operation and maintenance of the dishmachine. The first section explains how the machine is packaged and what to look for when receiving the machine.

After unpacking the machine, this manual explains how to install and set up the machine for use. Requirements are given for plumbing, wiring, and space considerations. *These attributes of the machine are always taken into consideration by our well-trained sales representatives prior to the order being placed.* In the manual, guidance is also given for installation to ensure that the machine will be able to run at optimum conditions.

The Operation section of the manual may be used for instruction and procedures when required. We make this portion of the manual easy to understand so that all levels of operators may be able to read and comprehend the operation of the machine. The function of the machine itself is mostly automatic and takes little training to put into full operation. The Operation section also includes diagnostic considerations (troubleshooting) for the machine when problems occur.

CMA warrants the workmanship of the machine.

**Caution: the EST- VL has a Heat Recovery (HR) system comprised of heat exchange coils that can become restricted or clogged if the water supplied to the machine contains lime scale, also known as hard water condition. The cold water supplied to the EST- VL should be analyzed and treated to maintain maximum 3.5 grains per gallon (gpg) or 60 parts per million (ppm) water hardness to prevent scale build up conditions and to optimize dishmachine operation. The first sign of scale build up conditions will be restricted water flow or having no flow of water to the rinse arms.**

**CMA recommends utilizing a water softening system to maintain water hardness measurements of 3.5 gpg or less. This will assure maximum results and optimum operation of the dishmachine.**

#### DISCLAIMERS

CMA expressly disclaims any and all warranties, express or implied, relating to the installation of any and all CMA equipment that is installed by chemical dealers, contracted servicers or third party servicers to CMA equipment. If the installation instructions are not followed exactly (to the letter), or, if any person or company conducting the installation of the CMA equipment, revise the installation procedures or alter the instructions in any manner, the CMA warranty becomes void. If, due to the improper installation of CMA equipment, this equipment ceases to operate properly or affects other parts of the CMA dishwashing equipment, in that the other parts become defective, the CMA warranty becomes void. CMA will not be liable or responsible or warrant CMA equipment, due to improper installation of any CMA model dishwasher.

**CMA does NOT endorse “Tankless On-Demand” water heaters for use on CMA Dishmachine products. On most applications, the volume of hot water required for commercial dishmachines exceeds the capacity of these types of heating sources. You will find that most, if not all, commercial dishmachines have been programmed with auto-filling features that require quick filling, with a designated limited time.**

**CMA DOES endorse, and highly recommends, the standard “tank” style water heaters, sized properly to handle each particular facility with their water heating requirements. A “tank” style water heater stores and supplies a large capacity of preheated water before providing hot water to the dishmachine. To meet required health codes, there must be a reliable and consistent flow of adequate hot water supplied to the dishmachine. If the facilities’ “tank” style water heater is marginal in size, CMA recommends installing a proper size Hatco Booster Heater, a CMA’s E-Temp 40 or 70-degree-rise Booster Heater (that can be installed on CMA Conveyors), or a CMA Temp-Sure Booster Heater (for door and undercounter dishmachines). All are designed to adequately achieve results.**



## 2.2. Receiving and Installation

The dishwasher is shipped from the factory in a corrugated box on a wooden pallet. The installation guidelines give a systematic procedure for setting up the machine.

Start by removing the dishmachine from the box. Remove the packaging, unwrap the machine and check for the following components:

- Inside the wash tank is a plastic bag with one control box key and a cam timer wrench.
- Tube stiffeners must be used to prevent the feed tubes from curling inside the chemical pail and sucking air. These are located on the outside of the machine with the chemical tubing already installed into the stiffeners. The ends of the chemical tubing have been flared so that the tubing will not pull out of the stiffener. Red is for detergent, white for sanitizer, and blue for rinse aid.

### 2.2.1. Electrical\*

Prior to installation make sure the electrical supply is compatible with the specifications on the machines data plate.

The EST-VL dishmachine and the booster heater must be hard wired directly to a proper dedicated 115 VAC, 60Hz and 240VAC,60Hz circuits equipped with proper circuit protection. The main power switch is at the top-right side of the control box.



### **DO NOT USE POWER CORD OR GFI OUTLET**

This unit **MUST BE** hard-wired to a  
dedicated appropriately size circuit breaker.

**WARNING:** Electrical and grounding connections must comply with the applicable portions of the National Electrical Code and/or other local electrical codes.

**Note:** For supply connections, use copper wire only rated at 90 degree C minimum.

### 2.2.2. Plumbing\*

The water supply connection is made with a 1/2" hot water line to the water supply inlet on the top of the machine. The water supplied to the machine is recommended to be 140° F. The time necessary to deliver water to the machine is controlled by the number four cam. This cam

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\* Electrical and plumbing connections must be made by a qualified person who will comply with all available Federal, State, and Local Health, Electrical, Plumbing and Safety codes

## Getting Started

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provides the serviceman with the opportunity to fine tune the machine to deliver the proper amount of water with each cycle.

**Note:** The required flowing water pressure to the dishwasher is 15-65 PSIG. If pressures higher than 65 PSIG are present, a pressure regulating valve must be installed in the water line to the dishwasher (by others). If flowing pressure is lower than 15 psi, improper machine operation may result.

The EST-VL Dishmachine has a 2" drain. The following section explains how to connect the drain.

**Notice to Plumber:** The plumber connecting this machine is responsible for making certain that the water lines are THOROUGHLY FLUSHED OUT BEFORE connecting to the dishwasher

Ask your municipal water supplier for details about your local water conditions prior to installation. Recommended water hardness is 3 grains per gallon or less.

**Note:** high iron levels in the water supply can cause staining and may require an iron filter. High chlorine levels in the water supply can cause pitting and may require a chloride removal system. If an inspection of the dishwasher or booster heater reveals lime buildup after the equipment has been in service, water treatment is recommended. If water softener is already in place, ensure there is a sufficient level of salt.\*

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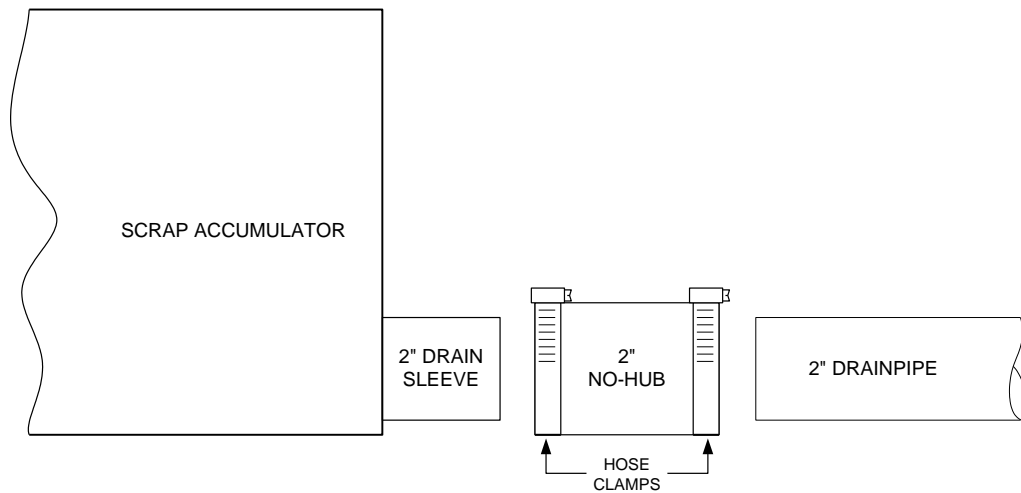
\* The de-liming agents used to de-scale a commercial dishwasher, are highly caustic and de-liming must be done by a qualified chemical specialist.

### 2.2.3. Connecting the Scrap Accumulator and Drain

The scrap accumulator is designed to perform two basic functions:

1. It allows a method to discharge all the heavy solids out of the machine with each wash cycle.
2. It provides accumulation capacity to allow draining the contents of one cycle regardless of the discharge rate of the existing drain.

The drainpipe is connected to the scrap accumulator drain using a 2" no-hub connector as shown in **Figure 2.2.3** below.



**Figure 2.2.3**

### 2.2.4. Straight to Corner Operation Retrofit Instructions.

In order to convert machine from straight to corner application, you will need to relocate the tray track rail from straight to corner position (see red line on the photo) and then mount it on the tray track using the same bolts, washers and lock nuts used for straight application.



## Getting Started

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## 3. Operation

### 3.1. Initial Setup\*

All machines are equipped with switches to prime the peristaltic pumps at anytime the master switch is "ON".

Following completion of the installation, always fill the machine with water before starting the machine.

1. With the power "ON" hold the fill button until the water level overflows into the scrap accumulator.
2. Check the chemical lines to the chemical containers.
  - a. Red: detergent line.
  - b. Blue: rinse agent line.
  - c. Clear/White: sanitizers line.

3. Activate the prime switches for the three chemical pumps until product is discharging into the machine.

**Note:** Use only commercial-grade detergents and rinse aids recommended by your chemical professional. Do not use detergents and rinse aids formulated for residential dishwashers.

Low Temperatures chemical-sanitizing dishmachines must not exceed 6% sodium hypochlorite solution (bleach) as the sanitizing agent. Higher levels may damage stainless or components.

Follow the directions precisely that are on the litmus paper vial and test the water on the surface of the bottom of the glasses. Concentration should be 50 p.p.m. minimum to 100 p.p.m. maximum. If concentration is incorrect contact your chemical supplier.

4. To start the machine, close the doors - this will automatically start the machine. The machine will run through its cycle.
5. Operate the machine one cycle and watch to ensure that the chemicals are delivered and stop during the cycle. Remember: red tube - detergent: blue tube - rinse: and clear/white tube - sanitizer. Check temperature at the end of the cycle for 140°F, 60°C.

The amount of product delivered by each cam is controlled by adjusting the cam's opening. When the micro switch rides down into the cam the peristaltic pump motor begins to rotate. It will continue to rotate until it rides up out of the groove.

Therefore, to extend the amount of product delivered to the machine, open the groove; to reduce the amount of product delivered to the machine, close the groove.

The cams are slip fit and a cam adjustment wrench is provided.

**CAUTION:** The motors on the new peristaltic pumps may be stalled by excessive tightening of the cover plate screws. If a peristaltic pump does not turn when the micro switch is activated, loosen the screws on the cover plate.

Technical personnel are available during normal business hours at CMA Headquarters should you, as an installer, have any questions, please call **800-854-6417**.

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\* The chemicals and water level must be programmed by a qualified chemical specialist.

### 3.2. Startup Procedures

Please follow the instructions given here before each shift to assure trouble free operation.

2. Drain the water if it is cold by activating the drain switch until all the water is out of the machine.
3. Check the drain screen and, if needed, remove it from the machine and clean it out. After cleaning, replace it properly into the sump housing.
4. Check the wash arm spray tips. If they are clogged, clean them with a toothpick and rinse them at the sink. Replace the wash arms.
5. Press and hold the fill switch until the water overflows into the scrap accumulator.
6. Once a proper water level is established, check the temperature of the water (it should be approximately 140°F, 60°C).
7. Insert the tray of dishes into the machine and close the doors. The machine will automatically start when the doors are closed.
8. After the machine stops, raise the doors, remove the tray of dishes and allow to dry before stacking.

If the doors are lifted during a cycle, the machine will automatically stop running.

The EST-VL will run through the wash and rinse cycles automatically feeding the proper chemicals and then turn itself off.

In an emergency you can turn off the machine by turning off the master switch located on the side of the control box.

**Warning:**

**Do not open the doors until the machines cycle light has turned off.**

## 3.3. Quick service guide

**MODEL: EST**

TECHNICAL ISSUE	Cause	Solution
Machine starts while doors are open	Faulty safety door switch	Replace the switch, P/N 00562.00
	Faulty start/fill switch	Replace the switch, P/N 03470.01
Continuous cycles	Faulty #1 micro switch (start/stop)	Replace micro switch, P/N 00411.00
	Faulty start/fill switch	Replace micro switch, P/N 00421.40
	Faulty safety door switch	Replace the switch, P/N 00562.00
Wash motor runs continuously	Delimer switch in wrong position	Switch to <i>NORMAL</i> position
	Faulty delime switch	Replace the switch, P/N 00475.00
	Faulty motor contactor	Replace contactor, P/N 00404.82
Sanitizer pump does not run	Delimer switch on wrong position	Switch to <i>NORMAL</i> position
	Faulty delimer switch	Replace the switch, P/N 00475.00
	Faulty # 6 micro switch	Replace micro switch, P/N 411.00
	Faulty sanitizer pump motor	Replace the motor, P/N 00416.00
Drain valve does not operate	Broken Spring	Replace spring, P/N 00105.82
	Faulty #3 Micro switch	Replace micro switch, P/N 00411.00
	Faulty drain motor	Replace drain motor, P/N 00104.82
Machine does not fill	Faulty #4 micro switch (Fill)	Replace micro switch, P/N 00411.00
	Debris inside water solenoid valve	Clean valve replace diaphragm kit, P/N 00707.00
	Faulty start/fill switch	Replace the switch, P/N 03470.01
	Drain not closing	check function of drain sys.
	Faulty water solenoid coil/valve	Replace coil/valve, P/N 00738.10 or 03603.10
Water leaks out of vacuum breaker	Faulty check valve	Replace valve, P/N 00718.00
	Low incoming water pressure	Increase water pressure to 20 psi
	Faulty vacuum breaker kit	Replace vac. Brkr kit, P/N 03623.00
Machine only runs when start/fill switch is depressed	Faulty #1 micro switch (start/stop)	Replace micro switch, P/N 00411.00
	Faulty door switch	Replace door switch, P/N 00562.00
Will not start/ nothing works	Wall breaker tripped	Reset breaker
	Master on/off switch faulty or in off position	Reset or replace switch, P/N 00471.10
Runs, but none of the other functions engage	Faulty #2 Micro switch (cycle reset)	Replace micro switch, P/N 411.00
	Faulty ice cube relay (yellow relay)	Replace relay, P/N 00636.00
Ventless feature not working properly	Replace if faulty	Replace if faulty
	Check exhaust fan	Assure 6" clearance for fan
	Check cam timer setting	Change the setting
	Faulty #9 micro switch	Replace micro switch



### 4. Addendum for Machines Installed in the City of Chicago

"All food dispensing EST-VL establishments using chlorine or other approved chemical sanitizers shall, at all times, maintain an adequate testing device."

"Dishes and other eating and drinking utensils to be washed in a dishwashing machine shall be properly scraped and pre-rinsed and shall be stacked in racks or trays so as to avoid overcrowding, and so as to permit the wash and rinse waters to reach all surfaces of each utensil."

"In machine washing, multi-use eating and drinking utensils shall be washed in water containing a suitable detergent at a temperature from 120 degrees F. to 140 degrees F. or other method approved by the Department of Health.

"The water in the wash tank shall be changed during operation as often as is necessary to keep it reasonably clean. An effective concentration of detergent in the wash water shall be maintained at all times."

"Bactericidal treatment shall consist of exposure of all surfaces of dishes and utensils being washed to a rinse of clean water, at a temperature of not less than 180 degrees F. or other method approved by the Department of Health."

"All dishwashing machines shall maintain a flow pressure not less than 15 or more than 25 pounds per square inch on the fresh water line at the machine and not less than 10 pounds per square inch at the rinse nozzles. A suitable gauge cock shall be provided immediately upstream from the final rinse spray to permit checking the flow of the final rinse water. An easily readable thermometer accurate to  $\pm 2$  degrees F. shall be provided on both the wash and rinse water lines of the dishwashing machine which will indicate the temperature of the water solution therein."

"Dishwashing machines shall be thoroughly cleaned at least once each day. The pumps and the wash and rinse sprays or jets shall be so designed that a forceful stream of water will reach all surfaces of the utensils when they are properly racked. These parts shall be thoroughly cleaned at least once each day. The pumps and the wash and rinse sprays or jets shall be so designed that a forceful stream of water will reach all surfaces of the utensils when they are properly racked. These parts shall be readily accessible for inspection and cleaning."

"After bactericidal treatment, utensils and containers shall be stored at a sufficient height above the floor in a clean, dry place, protected from flies, splash, dust, overhead leakage and condensation, and other contamination. Containers and utensils shall be inverted, covered, or otherwise protected from contamination until used for serving."

Drain racks, trays, and shelves shall be made of non-corrodible material and shall be kept clean.

In handling containers and utensils the surfaces thereof which come in contact with food or drink shall not be touched by the hands, except during the process of washing.

Tables for clean and dirty dishes and food shall be so arranged that the dirty dishes will be as far removed from the food and clean dishes as may be possible.

All single-service articles and utensils shall be purchased in sanitary cartons and stored therein in a clean, dry place until used, and after removal from the cartons, these articles shall be handled in such a manner as to prevent contamination.

**Please note the following procedures must be followed for City of Chicago Approval:**

- 1. All low energy models must have low-level sani alarms, both visual and audio.**
- 2. All models must have a City of Chicago approval data label affixed to the machine.**

## **Getting Started**

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- 3. Chlorine sanitizer must be a minimum of 100 PPM.**

## 5. Electrical Diagram

