Operation Manual

Glastender®

A Family Company Manufacturing In The USA Since 1969

GT-24 & GT-30 GLASSWASHER

GT-24-CW

GT-30-CCW

Glastender, Inc. · 5400 North Michigan Road · Saginaw, MI · 48604-9780
800.748.0423 · 989.752.4275 · Fax 989.752.4444 · www.glastender.com

Made in the USA

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Introduction

This manual describes the operational features of the GT-24 and GT-30 model glasswashers with digital temperature gauges. Please review this information before attempting installation and operation.

Long-term, trouble-free operation will follow if good housekeeping and maintenance procedures are followed. Thank you for selecting Glastender, Inc. products.

What is a Glasswasher?

Glastender, Inc. manufactured the original automatic rotary glasswasher in 1969. Today, Glastender glasswashers have been installed around the world.

But what is a glasswasher? It is simply a piece of machinery that washes glassware, which eliminates the need for human labor and the conventional three-compartment sink. The glasswasher is, in effect, a mechanized three-compartment sink. It "washes", "rinses", and "sanitizes" glassware.

Note the Simplicity:

Function	Design
Wash	Hot water and a preset portion of detergent join in the Wash Tank. Operating temperature is maintained between 130ºF (54ºC) and 150ºF (66ºC) by a stainless steel heater, and the proper water level is maintained with a liquid level control. During operation, 5 gallons per minute of hot soapy water are pumped in a forceful, but gentle, spray pattern across the moving glassware. This entire wash compartment is isolated by curtains, and the wash water is recirculated to conserve water and detergent. Actual hot water consumption during operation is ¼ gallon per minute.
Rinse and Sanitize	Cold water and a preset portion of sanitizer join in the sanitizing compartment called the Rinse Tank. The proper water level is maintained with a liquid level control. During operation, 2 gallons per minute of cold rinse water are pumped in a forceful, but gentle, spray pattern across the moving glassware and down the drain. The unique pumped rinse feature ensures a consistent, thorough rinse.

Please read on to learn more about this simple machine.

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Uncrating Instructions and Equipment Checklist

The glasswasher is shipped in one carton. Please refer to Figure 1 and locate the following items:

The items are:

Item Number	Description
1	Main Section
2	Stainless Steel legs (4)
3	Conveyor
4	Front Curtain
5	Wash Curtain
6	Rinse Curtain
7	Front Shield
8	Top Section

Assembly procedures:

Assembly Order	Description
1	Bolt the legs to the base of the Main Section.
2	Remove all packaging from the Main Section.
3	Remove plastic protective paper from all stainless steel parts. This may require removing side panels.
4	Place glasswasher in position and level by adjusting the bottom portion of the stainless legs.
5	Make plumbing and electrical connections (see page 8).

Figure 1

Note: Figure 1 shows a clockwise model with front switch panel.

Main Section - Top View

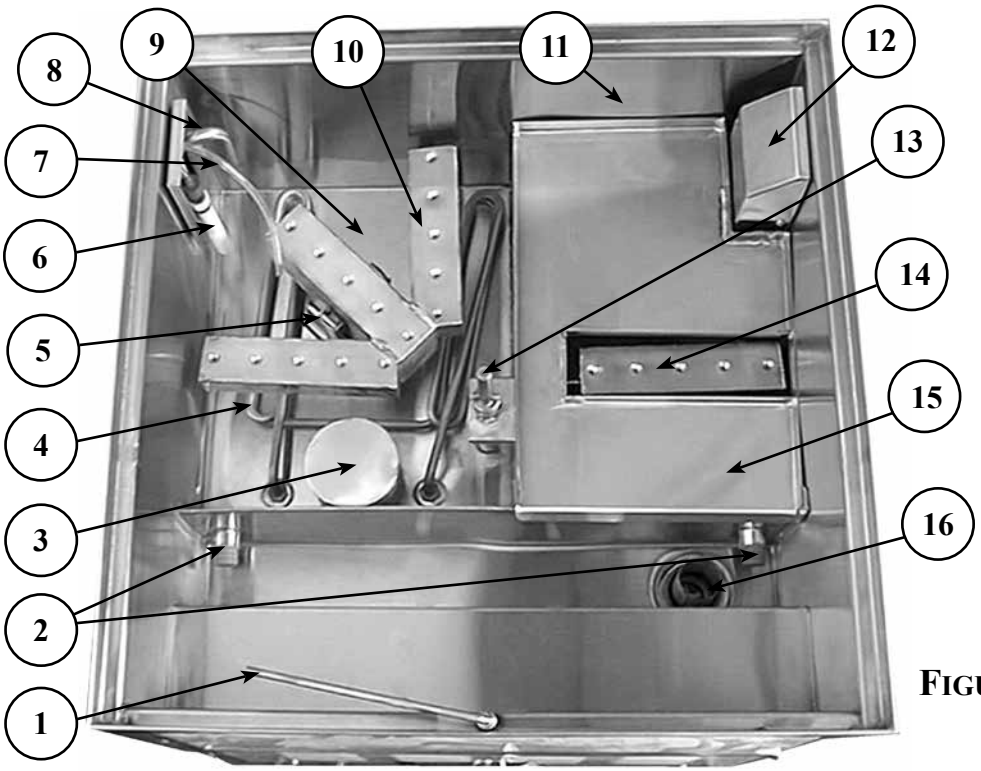


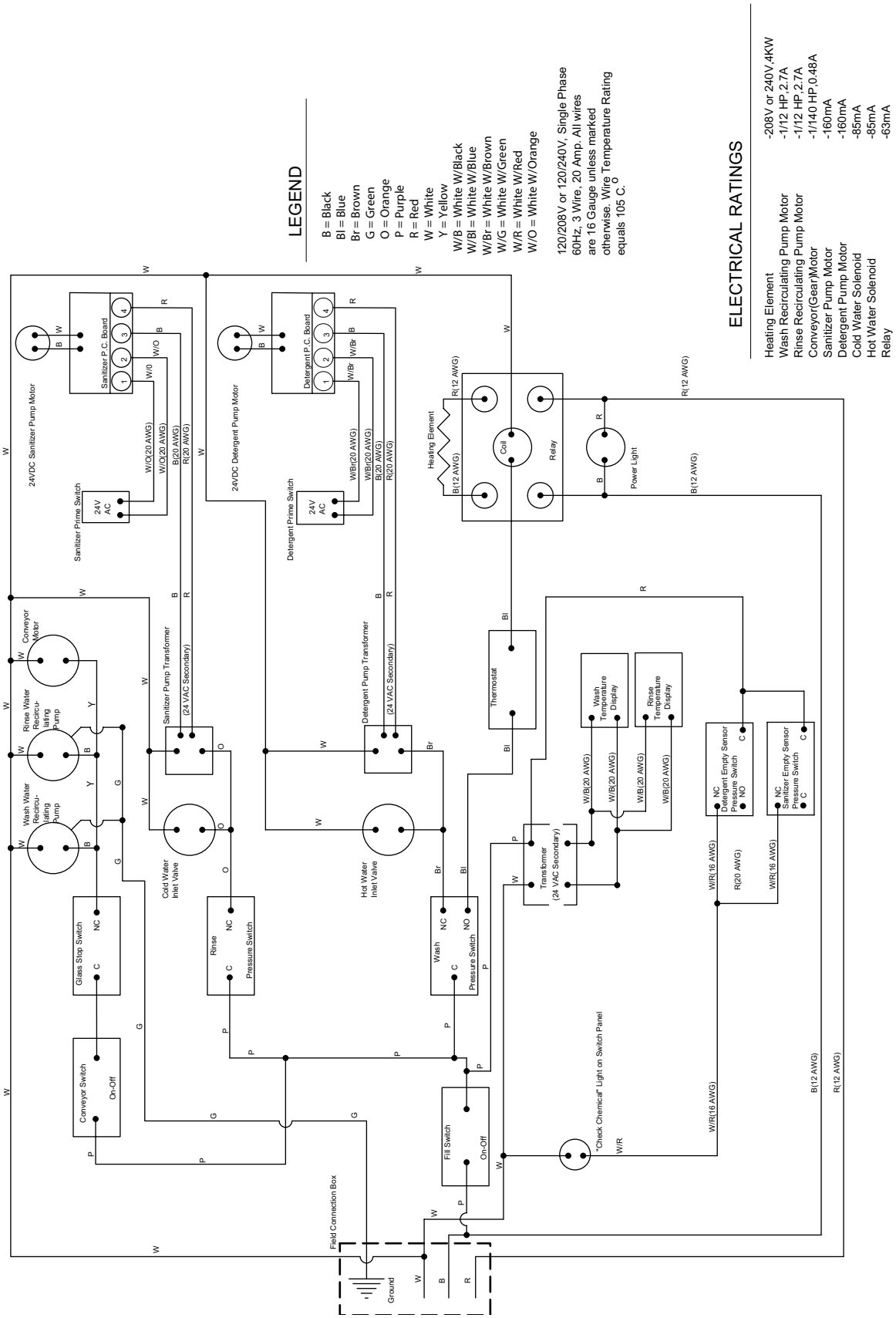
Figure 2

Note: Figure 2 shows a model GT-24 with clockwise conveyor movement. Counterclockwise conveyor movement models have identical parts in reverse positions.

Please familiarize yourself with the following parts:

Item Number	Description
1	Glass Stop Arm
2	Drain Plug (2 required)
3	Pump Inlet Screen (2 required) - One pump inlet screen is in the rinse tank hidden from view below the rinse tank guide.
4	Heater
5	Spray Box Cam Lock
6	Wash Tank Liquid Control and Low-Level Pick-Up Tube - The rinse tank liquid control and low-level pick-up tube is hidden from view by the rinse tank pick-up tube cover.
7	Detergent Inlet Tube
8	Hot Water Inlet and Air Gap (in side wall) - Pick-up tube cover has been removed for illustrative purposes.
9	Wash Tank
10	Wash Spray Box
11	Rinse Tank
12	Rinse Tank Pick-Up Tube Cover - The cold water inlet and sanitizer inlet tube are underneath the cover
13	Conveyor Drive Shaft
14	Rinse Spray Box
15	Rinse Tank Guide
16	Drain Tank with Drain Screen

WIRING DIAGRAM UNITS BEFORE JAN. 2003



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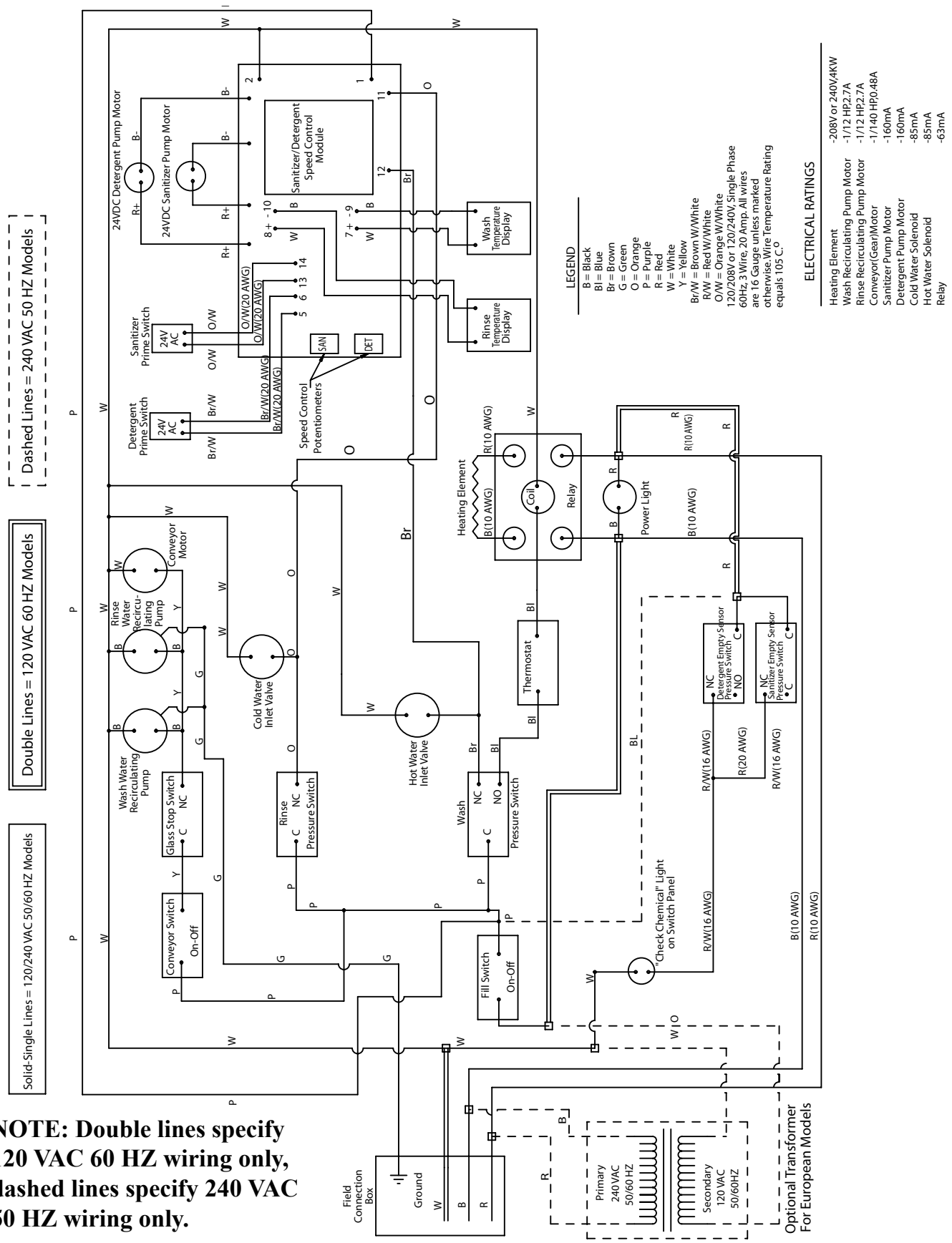
WIRING DIAGRAM UNITS AFTER JAN. 2003



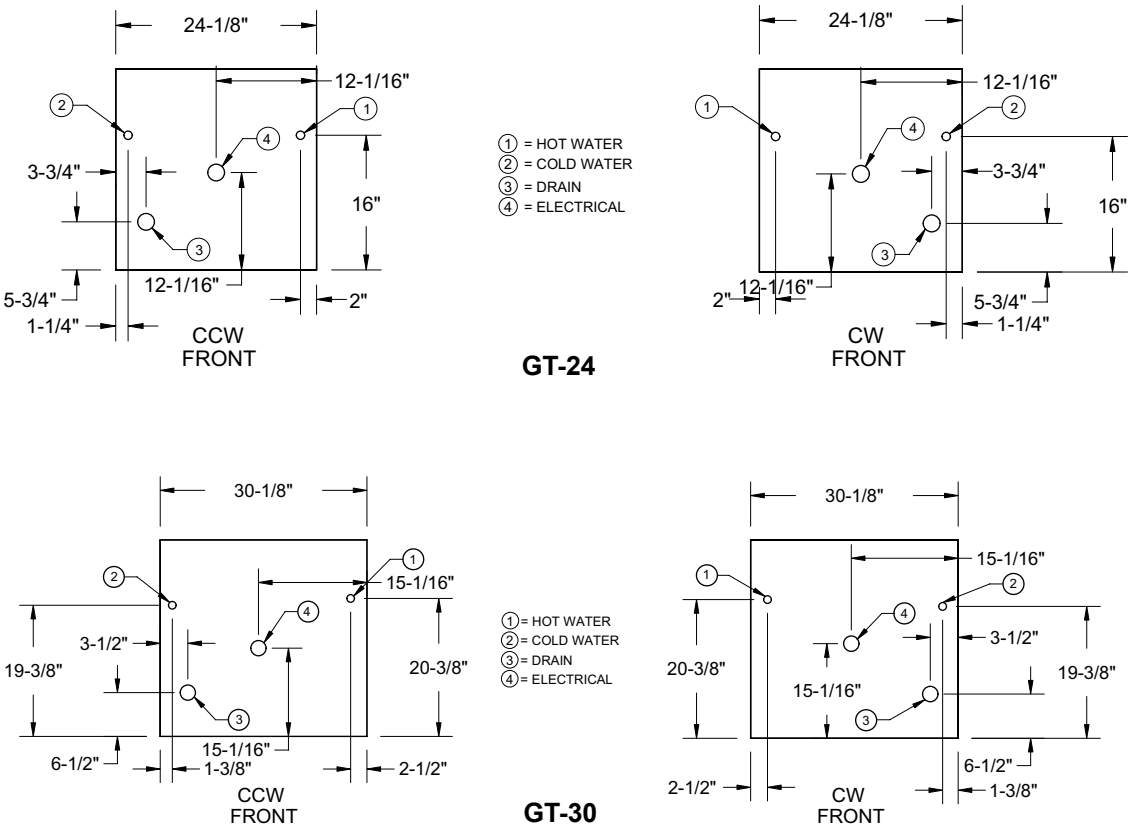
NOTE: Double lines specify 120 VAC 60 HZ wiring only, dashed lines specify 240 VAC 50 HZ wiring only.

UTILITY REQUIREMENTS AND CONNECTIONS

1. General Plumbing..... (Hot water and cold water required)
   a. Use 3/8" O.D. copper to 3/8" FMPT adapter provided.
   b. Minimum water pressure - 25 psi.
   c. Maximum water pressure - 100 psi. Install water pressure regulator if line pressure is over 100 psi. Water valve on unit has built-in line strainer and flow control to provide consistent volume between 25 psi and 100 psi.
   d. Install separate water shut-off valve for each connection.
   e. The unit has built-in air gaps. Vacuum breakers are NOT required.
2. Hot Water Only .....
   a. Maximum temperature 150° F (66° C). Minimum temperature 130° F (54° C).
   b. Initial fill 3.00 gallons (GT-24) or 3.50 gallons (GT-30).
   c. Consumption - 1/4 gallon per minute during operation.
3. Cold Water Only.....
   a. Minimum temperature is 75° F (24° C) per FDA Ordinance and Code for Food Service Establishments, Section 5-103(e)(2). Install hot/cold water mixing valve if necessary.
   b. Initial fill 2.25 gallons (GT-24) or 3.50 gallons (GT-30).
   c. Consumption - two gallons per minute during operation.
4. Drain.....
   a. 1-1/2" tailpiece provided on unit.
   b. Use open type floor drain for maximum drainage.
   c. Two white plastic drain cocks extending below the bottom are for recirculating pump drainage when required for pump replacement or winterizing. The drain cocks are shipped in the closed position. No plumbing is required.
5. Electrical.....
   a. Specifications: 120/208-240V, single phase, 60 Hz., 3 wire (two hot and one neutral), ground connection per local code (green wire), 20 amp for 240 volt or 30 amp for 208 volt (4 wires total). Unit will operate satisfactorily within 10% of rated voltage.
   b. A dedicated 20 Amp circuit is required [30 amp for 208V]
   c. A power relay in the unit separates the high and low voltages and directs the respective power to the electrical components. The heater and power light operate on 208 volts or 240 volts as specified. All other components operate on 120 volts.
6. Detergent .....
   a. An extra-heavy-duty, non-foaming, commercial liquid dishwashing detergent is required. Adjust to .30% concentration.
   b. The local chemical supplier should be consulted to match detergents with local water conditions.
7. Sanitizer.....
   a. Liquid chlorine bleach (sodium hypochlorite - 5.25% solution). Adjust to 50 PPM.
   b. Or low-sudsing iodine type sanitizer. Adjust to 12.5 PPM.

NOTES:.....
A. In all cases, consult local plumbing, electrical, and health codes for regulations which may not be consistent with the above.
B. The utility connections are made up from the floor at the bottom of the unit approximately 7" to 8" high.

Utility Requirements and Connections



Start-Up Instructions

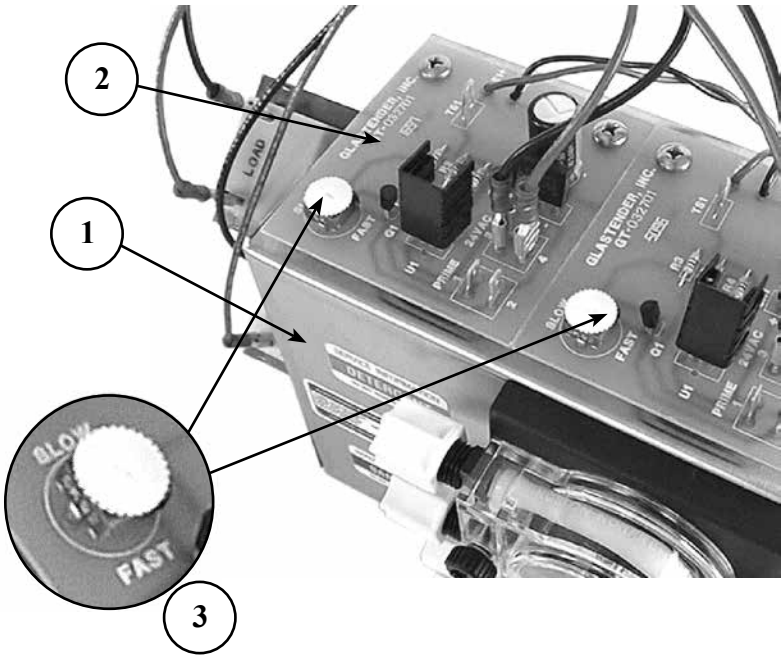
1. Place Top Section of glasswasher on the extreme rear of the Main Section (see Figure 1, page 3.).
   Note: The Glass Stop Arm always identifies the <u>front</u> of the unit.
2. Remove front panel of Main Section (see Figure 1, page 3.).
3. Detergent and Sanitizer Feed Lines are stored in Main Section. Access is provided in the floor of the front Main Section. Fully extend the Feed Lines to the Detergent and Sanitizer Containers which are external of the unit. Shorten Feed Lines if necessary.
   Note: Consult your chemical supplier for detergent and sanitizer products.
   a. Use an extra-heavy-duty, non-foaming, commercial liquid dishwashing detergent.
   b. Use liquid bleach (sodium hypochlorite - 5.25% solution) or low-sudsing iodine type sanitizer.
4. Remove Rinse Tank Guide.
5. Make sure the Fill Switch and Conveyor Switch are in the “off” position.
6. Open the hot water and cold water supply valves.
7. Turn electrical power “on.” Green Power Light will now be illuminated.
8. Turn Fill Switch to “on” position. The Wash Tank will fill with hot water and the Rinse Tank will fill with cold water. The liquid level controls will automatically turn off the hot water and the cold water when the tanks are full.
9. Depress Detergent and Sanitizer prime buttons until chemicals are observed dripping into the Wash and Rinse Tank respectively.
   Note: The prime button overrides the pre-set adjustment and dispenses at full speed.
10. Turn Fill Switch to “off” position.

START-UP INSTRUCTIONS

11. Remove Drain Plugs allowing tanks to drain.
12. Adjust Detergent and Sanitizer Pumps. (See pages 9-10)
13. Replace Drain Plugs.
14. Turn Fill Switch to "on" position. The Wash and Rinse Tanks should now fill near the top of the overflow walls. When the Wash Tank is full, the thermostatically controlled Heater will turn on and off as necessary to maintain the water temperature at approximately 150° F.
    NOTE: The Thermostat is preset at the factory.
15. Install Rinse Tank Guide (see Figure 2, page 4 - item 9).
16. Install Wash, Rinse, and Front Curtains (see Figure 1, page 3 - items 4, 5, and 6).
17. The unit is now ready to test detergent and sanitizer strength. Your chemical supplier will test the concentration levels which are:
    a. .30% for detergent, and
    b. 50 PPM (parts per million) for chlorine bleach sanitizer, or
    c. 12.5 PPM for iodine sanitizer.
    Turn Conveyor Switch to "on" position for approximately 30 seconds to mix water and chemicals for testing purposes. If further adjustment is necessary, refer to the next section on Peristaltic Pump Adjustment.
18. This glasswasher is equipped with an Empty Sensor for the Detergent and Sanitizer. Check the operation by lifting the Detergent Feed Line from the Detergent container. This should turn on the visual alarm. Place Detergent Feed Line back into Detergent container and repeat procedure for Sanitizer Feed Line.
19. Install Conveyor (see Figure 1, page 3 - item 3) and Front Shield (see Figure 1, page 3 - item 7). The Front Shield clips to the Top Section.
20. Install front panel of Main Section (see Figure 1, page 3).
21. Your glasswasher is now ready for operation.

PERISTALTIC PUMP ADJUSTMENT

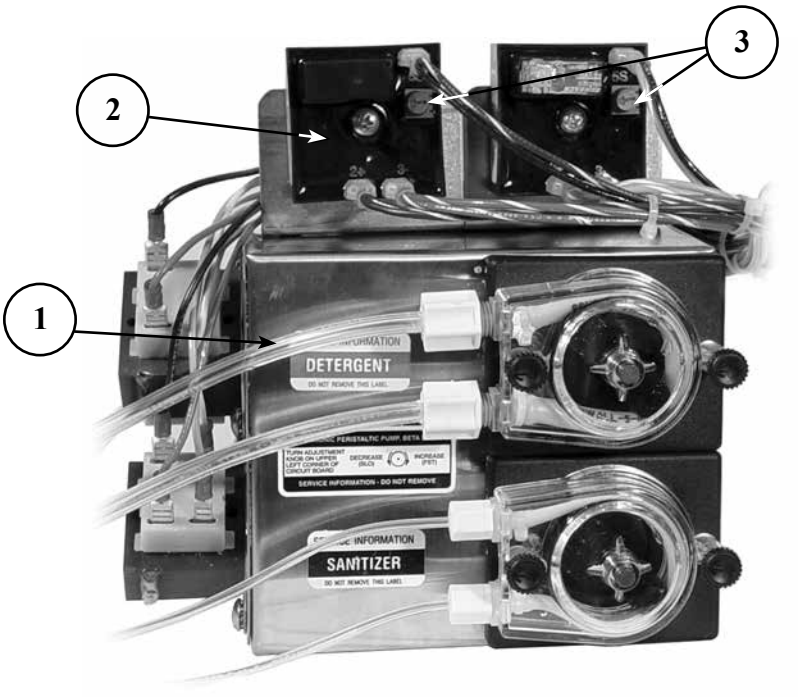
UNITS MANUFACTURED BEFORE JANUARY 2003 - DISCONTINUED CIRCUIT BOARD TYPE



1. Locate Peristaltic Pump in Glasswasher.
2. Locate Pump Control Circuit Board.
3. Each pump has its own adjustment dial. One for Detergent and one for Sanitizer. Turn dial clockwise for faster pump speed or counter-clockwise for slower pump speed.

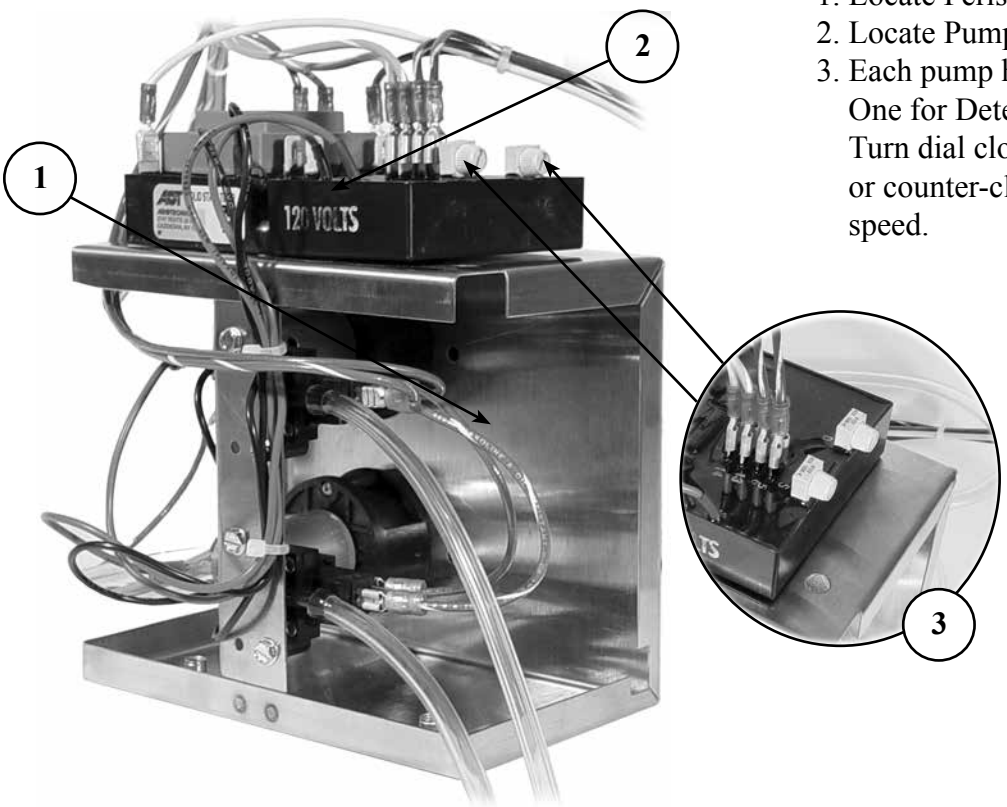
Peristaltic Pump Adjustment

Units Manufactured Before January 2003 - Cube Relay Timer Type



1. Locate Peristaltic Pump in Glasswasher.
2. Locate Pump Control Cube Relay Timers.
3. Each pump has its own adjustment dial. One for Detergent and one for Sanitizer. Turn dial clockwise for faster pump speed or counter-clockwise for slower pump speed.

Units Manufactured After January 2003 - Pump Control Module Type



1. Locate Peristaltic Pump in Glasswasher.
2. Locate Pump Control Module.
3. Each pump has its own adjustment dial. One for Detergent and one for Sanitizer. Turn dial clockwise for faster pump speed or counter-clockwise for slower pump speed.

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Useful Information About Water, Detergent, and Sanitizer

Water Conditions

Your water supply fits one of the following descriptions.
Greater detergent consumption is required with "hard" water.

Description	Grains Per Gallon	Parts Per Million
Soft	Less than 1.0	Less than 17.1
Slightly Hard	1.0 to 3.5	17.1 to 60
Moderately Hard	3.5 to 7.0	60 to 120
Hard	7.0 to 10.5	120 to 180
Very Hard	10.5 and over	180 and over

Detergent Titrating Instructions

An Alkalinity Test Kit, as recommended by your chemical supplier, is required for proper chemical adjustment. Follow kit instructions to test.

Sanitizer Titrating Instructions

Operate glasswasher to allow sanitizer levels to stabilize. With Conveyor removed and Conveyor Switch "On", dip Chlorine or Iodine test strip into Rinse Tank near Rinse Spray Box for one (1) second. Then immediately compare the strip to the scale on the side of the test strip container tube. Adjust sanitizer (bleach) to 50 PPM, and iodine type sanitizer to 12.5 PPM.

Important note: Glasswashers are **NOT** water conditioners. Consult local water conditioning experts to determine your specific water condition.

How to Operate the Glasswasher

The automatic rotary conveyor glasswasher is designed to "wash, rinse, and sanitize" hundreds of glasses per hour. The rotating conveyor automatically moves glassware through the three operations.

Since the machine is typically dis-assembled for cleaning at the end of each day, start each day by ensuring that the machine was properly re-assembled after the previous day's use. Once re-assembly is complete, press the fill switch to fill the wash and rinse tanks with water. The machine is now ready for use.

Press the conveyor switch to put the conveyor in motion. The conveyor rotation determines the loading side of the glasswasher. A clockwise rotation loads on the left side, a counterclockwise rotation loads on the right side.

Remove all garnishes, straws, and ice from the soiled glass before loading the glasswasher. Turn the glass upside down and load the conveyor. The glass will spend approximately 60 seconds in the wash section and approximately 60 seconds in the rinse section. The conveyor movement automatically stops when the clean glass touches the "glass stop arm." Removing the glass starts the conveyor. Or, if extremely busy, the "glass stop arm" can be set aside with starting and stopping controlled by the "conveyor switch."

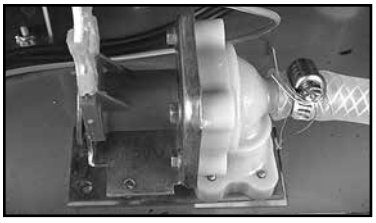
At the end of each day, turn off the conveyor and fill switches. Remove the drain plugs to empty the water from the wash and rinse tanks and follow the cleaning procedure outlined on pages 17 and 18 of this manual.

How the Glasswasher Operates

An important part of owning a GT-24 or GT-30 glasswasher is becoming familiar with the machine's components and operation. This section of the Operation Manual covers machine operation and identifies some of the machine components. Many more of the machine components are identified on pages 2 through 4 of this manual.

When the fill switch is turned on at the start of each day, water inlet valves send water to each tank through the stainless steel inlet tubes on the side of each tank. The wash and rinse tanks each have their own water inlet valve.

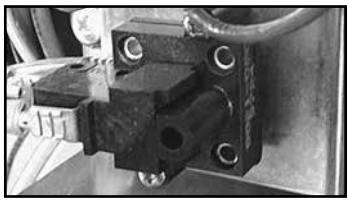
Switch Panel


Water Inlet Valve

The water level in each tank is controlled by an air switch and low-level sensor pick-up tube. When the fill button is on, the water level rises and increases the air pressure inside the pick-up tube, much like placing an empty glass upside down into water traps air inside the glass. The increased pressure triggers the air switch to turn off the water inlet valve. When the machine is in operation (spraying water), water is lost. A decrease in the water level in a tank decreases the air pressure inside the pick-up tube, which triggers the air switch to turn on the water inlet valve.

The same air switch and low-level pick-up tube assembly that controls the water inlet valve for the wash side, also controls the detergent pump (and the rinse side controls the sanitizer pump). Whenever the machine is filling with new water, it is also filling with new chemicals, which makes sense, because you only need to add new chemicals if you are adding new water.

Stainless Water Inlet Tube and Low-Level Sensor Pick-Up Tube (Cover Removed)


Air Switch

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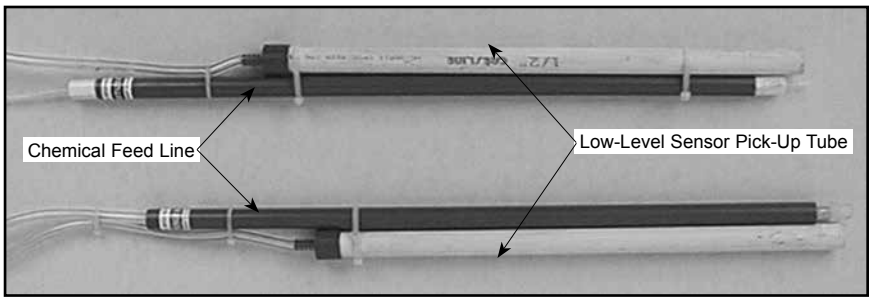
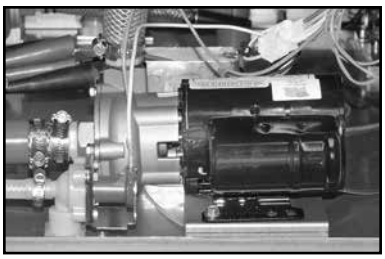
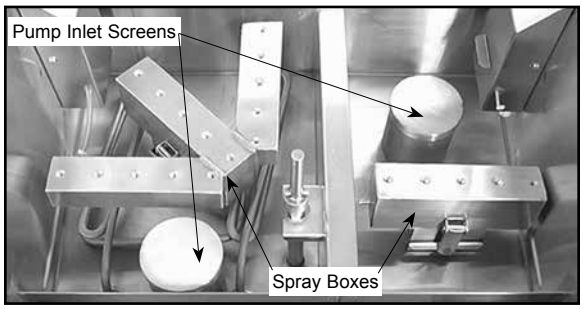
The chemical pumps have chemical feed lines that are attached to a chemical low-level sensor pick-up tube. One set of lines is labeled for detergent and the other for sanitizer. Both set of lines must be placed inside the appropriate chemical container. The purpose of the chemical low-level sensor pick-up tube is to make the low-level chemical light flash when the chemicals get low. There is an air pressure switch on the other end of the chemical low-level pick-up tube line and when the chemical level gets low the pressure on the switch decreases, turning the switch on, and causing the low-level chemical light on the switch panel to blink. *It is very important to clean the pick-up tube assembly from time to time and to prevent the assembly from being cracked or damaged. Debris clogged in the pick-up tube or a crack or hole in the pick-up tube assembly can cause a false low level chemical reading.*



Detergent and Sanitizer Feed Lines with Chemical Low Level Sensor Pick-Up Tubes Attached

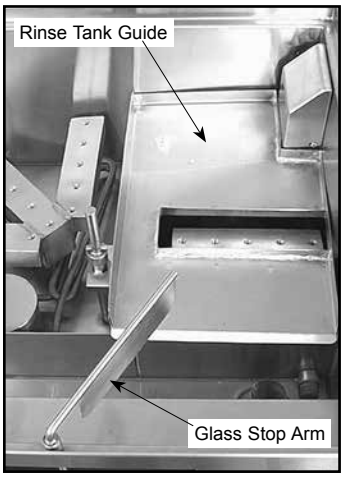

Water Recirculating Pump

When the fill switch is on, turning on the conveyor switch puts the conveyor in motion. Whenever the conveyor is in motion, water is spraying through the spray boxes in each of the tanks. There is a water recirculating pump for each tank that sucks water from the tank and forces it through the spray box and onto the glassware. *It is important to have the pump inlet screens in place to prevent foreign debris (broken glass, lemon seeds, etc.) from being sucked in and damaging the water recirculating pump.*



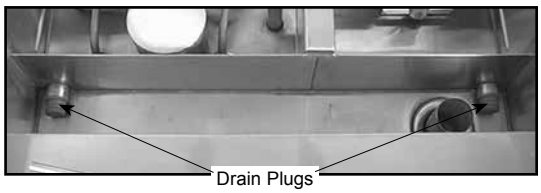
Inside view of wash and rinse tanks for clockwise GT-24

Glassware is placed on the rotating conveyor so it can pass through the wash section and then the rinse and sanitize section. The GT-24 and GT-30 glasswashers have a glass stop arm (or flag) that stops the conveyor when the glassware strikes it. This is intended to prevent the machine from operating constantly and washing the same glassware repeatedly. However, during busy times, the glass stop arm can be manually moved to the side so the conveyor will run constantly.



The GT-24 and GT-30 also have three curtains and a rinse tank guide. The front curtain is to prevent water from splashing out the front of the machine. The wash and rinse curtains run perpendicular to the front curtain and are intended to prevent the wash and rinse water from mixing. The rinse tank guide is a stainless cover over the rinse tank (it has a hole over the spray box) that guides the used rinse water to the drain compartment so the rinse water is not used more than once. Wash water is re-used, but the constant splashing causes much of the water to escape into the drain tank, so fresh water and chemicals are being regularly added to both the wash and rinse tanks. Since the rinse water is not re-used, the rinse tank uses more water than the wash tank when the machine is in operation.

At the end of each day of operation, turn off the conveyor and fill switches and remove the drain plugs to empty the wash and rinse tanks. [NOTE: Always be careful when removing the drain plugs, since the wash water is hot.] Simple daily cleaning takes approximately five minutes. Follow the cleaning procedures outlined on pages 17 and 18 of this manual and perform the heavier cleaning procedures, such as de-liming, as necessary.



WHAT ARE THE PRIME SWITCHES?

Chemical pumps have a speed control so they can be made to run faster or slower (see pages 9-10). Chemical vendors adjust the amount of chemicals that get inserted into a tank of water by altering the speed of the chemical pump. The water inlet valve only takes a certain amount of time to fill the tank. The chemical pumps only operate when the tank is filling, so adjusting the speed of the pump will increase or decrease the amount of chemicals dispensed during the fill time.

Prime switches are used to empty excess air from the tubing and fill it with chemicals by overriding the speed control and forcing the chemical pumps to operate at full speed. CAUTION: NEVER PRIME CHEMICAL PUMPS WITHOUT WATER IN THE TANKS. UNDILUTED CHEMICALS CAN DAMAGE STAINLESS STEEL.

NOTICE: On models manufactured before January 2003, the prime switches and the pumps only work when the machine is filling with water. The best way to use the prime switches is to remove the rubber drain plugs for each tank while the fill button is on, which causes the machine to constantly fill with water. Since the plugs are out, the water level will never rise high enough to turn off the liquid level air switches, thus the water inlet valves and the chemical pumps will operate constantly. ALWAYS BE CAREFUL WHEN REMOVING THE DRAIN PLUGS, SINCE THE WASH WATER IS HOT.

TIPS FOR TROUBLE-FREE OPERATION

1. **NEVER, NEVER** wash ash trays in the glasswasher. Since ashes are smaller than the opening in the Pump Inlet Screens, ashes could adhere to glasses. Also, with ashes recirculating in the wash water, the cleaning effectiveness of the detergent is greatly reduced. The final result of washing ash trays is dirty glasses.

2. For best results, keep the Conveyor full of glassware. This keeps the water and detergent consumption to a minimum.

3. Water spotting can occur when glassware is placed on flat surfaces after washing, thus preventing air to assist the drying process. Make sure the proper shelf liner is used.

4. The maximum glass height is eleven (11) inches to fit through the Top Section of the glasswasher. Keep this in mind when ordering beer pitchers and wine carafes.

5. Glasses which have been frequently washed by hand may have deposits of invisible “film”. Although initially appearing clean, these glasses may show unsightly signs of “dirt” after passing through the glasswasher. This unsightly condition will exist until the film is removed with frequent passes through the glasswasher, or it may be necessary to use a de-liming agent to clean glassware.

6. Do not place wet glasses into glass chillers or frosters. Allow glasses to dry and sanitizer odors to dissipate first.

7. Changing detergents may require readjustment of the Detergent Pump to maintain .30% detergent concentration. A greater volume of low-strength detergent is required to maintain the proper level.

8. Only Glastender, Inc. replacement parts should be used. Components from other suppliers may result in machine malfunctions.

Please consult your Glastender, Inc. service agent if service or technical assistance is required. The factory is also available to answer any operational questions.

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Important Information About Chemicals

The GT-24 and GT-30 glasswashers have chemical pumps that automatically dispense chemicals into the machine. The detergent and sanitizer chemicals are supplied by a chemical vendor. Since the type of chemicals and the condition of water varies by region, the chemical pumps are not pre-set at the factory. *The chemical pumps must be adjusted at start-up to achieve the proper titration levels or the machine may not produce good wash results.* Typically, the chemical vendor is responsible for adjusting the chemical pumps.

Since detergent and sanitizer chemicals play an important role in the performance of a glasswasher, understanding how the chemical pumps work and how to maintain them is very important. Reviewing the following information will help ensure the proper operation of your glasswasher and its chemical pumps:

1. CAUTION: Never prime chemical pumps without water in the tanks. Undiluted chemicals can damage stainless steel. NOTE: On models manufactured before Jan. 2003, the prime switches will only operate when the machine is filling with water (See page 14 for more information).

2. The chemical feed line and the chemical empty sensor line must be attached and properly placed inside the appropriate chemical container. Damaged chemical lines will spill chemicals on the machine and floor and create poor wash results. Damaged or dirty chemical low-level lines will cause a false low level reading.

3. Every glasswasher requires chemical pump adjustment and titrating by a chemical vendor. Poor wash results will occur if the chemicals are not in proper concentration (see the operation manual for proper concentration levels).

4. Glasswasher chemicals are highly caustic and will cause severe burns when they contact human skin. These same caustic chemicals will also corrode stainless steel and destroy machine components. A glasswasher should be checked regularly for chemical leaks and any leaks should be corrected immediately.

5. All of the chemical tubing on a glasswasher should be inspected regularly and replaced at least once per year. The highly caustic chemicals cause the chemical tubing to get brittle, and since leaking chemicals destroy glasswasher components, it is good preventative maintenance to replace chemical tubing often. The various tubing includes the lower tubing assembly or main chemical feed line, the pump squeeze tube (especially susceptible to damage), and the upper tubing assembly from the pump to the glasswasher tank.

6. A GT-24 or GT-30 glasswasher can use either Iodine or Chlorine for sanitizer. Iodine is often used in hard water conditions, because it has a sheeting action the helps to prevent water spots. You cannot switch between these two different chemicals for sanitizing without re-adjusting the chemical pumps, because they require different concentration levels.

7. Chemical vendors that deliver chemicals to your establishment are typically responsible for adjusting the chemical levels in your glasswasher. They are also helpful for assisting you with chemical tubing inspection and replacement. Nothing removes your responsibility for proper maintenance, but the chemical vendor will help.

Diagnosing Poor Wash Results

The best way to understand why you are getting poor results is to know what components belong in your machine and how they are supposed to operate. If you are getting poor results from your GT-24 or GT-30 glasswasher, follow these simple steps to help diagnose your problem.

Possible Cause	Remedy
1. The machine is dirty and/or the spray box holes are clogged. The machine may require de-liming, because of excess water deposit build-up.	1. Clean and/or de-lime the machine.
2. The machine is missing components, like the wash and rinse curtains or the rinse tank guide, which can cause the wash and rinse water to mix or the rinse water to be re-used.	2. Replace missing components.
3. The chemical feed lines are in the wrong chemical container.*	3. Put the chemical feed lines in the proper container.*
4. The chemical containers are empty, so that no chemicals are being dispensed into the glasswasher.*	4. Get a new jug of chemicals. Pump priming may be required.*
5. The chemicals are in the wrong concentration. This is usually evidenced by slimy or greasy feeling glasses, even though all of the machine components are in place and the chemical feed lines are in the proper containers.*	5. Contact your chemical vendor to have the concentration levels checked.*
6. The chemical tubing is disconnected or damaged and leaking somewhere instead of getting into the wash or rinse tank.*	6. Replace chemical tubing. Your chemical vendor may help or contact your service company.*
7. Water is not spraying through the wash or rinse spray box.	7. The water recirculating pump is plugged or broke. Have your service company inspect it.

* NOTE: Commercial dishwashing detergent and sanitizer are highly caustic and will burn human skin on contact. Please exercise extreme caution when handling.

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CLEANING INSTRUCTIONS

The following cleaning instructions are recommended. Operating procedures of an establishment may alter the time of cleaning and the personnel assigned to cleaning.

At the close of business, and after all glasses have been washed and unloaded, turn the Conveyor Switch and the Fill Switch to the "off" position. No other attention is required until the next morning.

In the morning, the bartender should follow the recommended cleaning instructions. The bartender is responsible for the drink quality of the establishment. Since drink quality includes clean glassware, knowledge of the glasswasher is important.

STEP-BY-STEP INSTRUCTIONS

1. Remove the Front Shield.
2. Position Glass Stop Arm past the Conveyor.
3. Removing the Front Curtain(s). (Note the two attachment tabs.)
4. Remove Conveyor.
5. Turn the Fill Switch to the "on" position to insure that the Wash and Rinse Tanks are full.
6. Turn the Conveyor Switch to the "on" position for as long as necessary to check the 15 nozzles in the Wash Spray Box and the five (5) nozzles in the Final Rinse and Sanitize Spray Box for a uniform spray pattern.
7. Turn the Conveyor Switch and Fill Switch to the "off" position.
8. Remove Drain Plugs to drain tank.
9. Remove Rinse Tank Guide.
10. See which condition listed below best fits the unit. Then follow the suggested procedures.

CONDITION	DESCRIPTION	COMMENT	PROCEDURE
LIGHT	Moderate debris in tanks (straws, garnishes, etc.). All spray nozzles are functioning.	This unit is receiving proper user maintenance. All personnel should be congratulated for doing a good job.	Follow LIGHT procedures on next page.
MEDIUM	Light film in Wash Tank. Considerable debris in the tanks (straws, garnishes, and/ or broken glass, etc.). Possible plugged spray nozzle(s).	This condition shows you were were busy last night, or proper maintenance has been neglected.	Follow MEDIUM procedures on the next page.
HEAVY	Light to heavy white chalky substance (herein after referred to as "lime") completely covers the Wash Tank and components, especially the Heater. Excessive debris in the tanks (straws, garnishes, broken glass, etc.). Plugged spray nozzles.	Unit has been neglected. Install proper maintenance procedures immediately. **Caution:** If the unit operates in this condition, Heater and Recirculating Pump failures may result.	Follow HEAVY procedures on the next page.

Cleaning Instructions

LIGHT Cleaning Procedures:

a. With tanks drained, remove all debris.
b. Remove both Pump Inlet Screens.
c. With damp cloth, wipe the interior of both tanks.
d. Rinse the interior with clean water.
e. Rinse the Pump Inlet Screens with clean water.
f. Proceed to Step 11 below.

MEDIUM Cleaning Procedures:

a. With tanks drained, remove Wash Spray Box, Spray Box Gasket, and Pump Inlet Screens.
b. Remove all debris.
c. Thoroughly scrub and rinse all components removed from unit.
d. With a Scotch-brite pad, normally purchased in a grocery store, thoroughly scrub the interior of the unit. The Top Section can be removed for ease of cleaning. Do **NOT** use steel wool.
e. Rinse the interior with clean water.
f. Proceed to Step 11 below.

HEAVY Cleaning Procedures:

a. Reinstall Tank Plugs and Screens.
b. Turn Fill Switch to "on" position to fill Wash and Rinse Tanks.
c. Pour one cup of de-liming agent into the Wash Tank and one cup of de-liming agent into the Rinse Tank.
d. Reinstall Conveyor, Front Curtain(s), and Front Shield.
e. Allow the unit to reach operating temperature.
f. Turn Conveyor Switch to the "on" position.
g. Allow the unit to operate for 15 to 20 minutes.
h. Turn Conveyor Switch to the "off" position.
i. Remove Front Shield, Front Curtain(s), and Conveyor.
j. Remove Tank Drain Plugs.
k. If lime has not been completely removed, repeat steps "a" through "j" above.
l. With all the lime removed, proceed to Medium Cleaning Procedures above. Follow steps "a" through "f".

11. Reinstall all components removed for cleaning except Conveyor, Front Curtain(s), and Front Shield. See Figure 2, page 4.
12. Check Detergent and Sanitizer Containers. Refill or replace if empty.
13. Turn Fill Switch to the "on" position.
14. Visually inspect Detergent and Sanitizer Inlets while tanks are filling. Detergent and sanitizer should be intermittently dripping.
15. Replace Conveyor, Front Curtain(s), and Front Shield.
16. Allow the unit to reach operating temperature.
17. Your glasswasher is now ready for operation.

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TROUBLESHOOTING GUIDE

TROUBLE OR SITUATION	CAUSE	REMEDY
A. **Unit does not run**	1. No power (Power light "off.")	1. Check power source.
	2. Fill switch "off."	2. Turn fill switch to "on" position.
	3. Conveyor switch "off."	3. Turn conveyor switch to "on" position.
	4. Glass stop switch in Conveyor stop position.	4a. Glass holding glass stop arm in conveyor stop position. 4b. Front shield restricting glass stop arm movement.
	5. Defective fill switch.	5. Check if wash and/or rinse tanks fill. If not, replace fill switch.
	6. Defective conveyor switch or glass stop switch.	6. These switches are wired in series. Test and replace defective switch.
	7. Wire connections poor, loose, or broken.	7. Re-crimp and/or replace wire connection.
B. **Conveyor runs but wash and/or rinse tank(s) not filling and detergent and/or sanitizer pump is not operating**	1. Bad liquid level switch.	1. Check switch continuity. Replace if necessary.
	2. Liquid level out of adjustment.	2. Adjust liquid level pickup tube.
	3. Water "off."	3. Turn water "on."
C. **Conveyor runs but wash and/or rinse tank(s) not filling, and detergent and/or sanitizer pump is operating**	1. Bad water valve.	1. Test valve, replace if necessary.
	2. Loose pulley(s).	2. Tighten set screw(s). Note: The drive motor pulley has an internal sleeve. Set screw could be tightening against sleeve instead of motor drive shaft.
D. **Conveyor moves intermittently**	1. Loose belt.	1. Tighten belt by first loosening the four motor mount towards front and retighten bolts. Caution: Excessive belt tension could cause drive motor failure.
E. **Water recirculating, conveyor not moving**	1. Obstruction in wash or rinse area.	1. Remove obstruction.
	2. Conveyor not engaged with conveyor drive shaft.	2. Rotate conveyor until it engages.
	3. Defective drive motor.	3. Replace drive motor.
	4. Defective of loose belt.	4. Replace or tighten belt.
F. **Hot glasses at end of cycle**	1. Rinse tank guide not in place.	1. Replace rinse tank guide.
	2. Plugged drain.	2. Clean drain.
	3. Hot water supply connected to cold water inlet.	3. Replumb with cold water.

Troubleshooting Guide

Trouble or Situation	Cause	Remedy
G. **Wash and/or rinse water not recirculating**	1. Completely plugged pump inlet screen. 2. Defective recirculating pump.	1. Clean pump inlet screen. 2. Replace recirculating pump.
H. **Water leaking from recirculating pump housing - water on floor**	1. Defective pump seal.	1. Replace pump seal.
I. **Glasses slimy or soapy at end of cycle**	1. Sanitizer feed line in detergent container. 2. Rinse water not recirculating.	1. Clean line and place in proper container. 2. See G above.
J. **Water spraying from front of unit**	1. Partially plugged spray box nozzle(s). 2. Front curtain not in place. 3. Worn front curtain.	1. Clean spray box nozzle(s). Refer to cleaning instructions, pg. 17-18. 2. Install front curtain. 3. Replace front curtain.
K. **Recirculating wash and/ or rinse pressure low**	1. Spray box not latched properly. 2. Partially plugged pump inlet screen. 3. Missing or worn spray box gasket.	1. Latch spray box properly. 2. Clean pump inlet screen.Refer to cleaning instructions, pg. 17-18. 3. Replace gasket(s).
L. **Low operating temperature**	1. Thermostat set too low. 2. Cold water supply connected to hot water inlet. 3. Heater coated with lime. 4. Defective heater. 5. Defective relay. 6. Low power supply.	1. Increase temperature by turning screw clockwise. 2. Replumb to hot water. 3. De-lime wash tank. Caution: Excessive lime build-up can cause heater failure. 4. Replace heater.* 5. Replace relay. 6. Check voltage and heater. 208V and 20V are available.

*NOTE: An Ohm meter can be used to verify if the heater is defective. Proper readings are: 208V = 9.5 to 11.5 240V = 13.1 to 15.0

M. **Hot water runs continuously, and detergent pump is functioning**	1. Liquid level out of adjustment. 2. Defective liquid level switch.	1. Remove obstruction or readjust. 2. Test switch and replace if necessary.
N. **Hot water runs continuously, but detergent pump turns on and off**	1. Hot water inlet valve not seating properly.	1. Clean or replace hot water inlet valve.

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TROUBLE OR SITUATION	CAUSE	REMEDY
O. **Cold water runs continuously, and sanitizer pump is functioning**	1. Liquid level out of adjustment. 2. Defective liquid level switch.	1. Remove obstruction or readjust. 2. Test switch and replace if necessary.
P. **Cold water runs continuously, but sanitizer pump turns on and off**	1. Cold water inlet valve not seating properly.	1. Clean or replace cold water inlet valve.
Q. **Heater glowing**	1. Wash tank water valve not opening. 2. Liquid level switch stuck in closed position.	1. Replace valve. 2. Replace switch.
R. **Detergent and/or sanitizer not feeding properly**	1. Detergent and/or sanitizer container(s) are empty. 2. Feed lines will not fill.	1. Refill or replace container(s). 2. Replace defective parts. Notes: The detergent or sanitizer product advances in the line on each stroke of the pump. The product should hold position between strokes. If the product falls back toward the supply container, one or more of the following conditions may exist: a. Debris in pump, b. Split feed line, or c. Bad pump tube. Replace parts as necessary.
S. **Poor washing results**	1. Clogged spray nozzles and dirty wash tank. 2. Detergent container empty. 3. Poor water conditions. 4. Chemicals not adjusted properly. 5. Curtains not installed properly.	1. Clean unit. See cleaning instructions, pg. 17-18. 2. Fill container. 3. Have filter or softener installed. 4. Call chemical technician. 5. Install curtains properly.
T. **Glasses are "sudsy"**	1. Iodine-type sanitizer used.	1a. Re-adjust iodine solution. 1b. Replace with chlorine bleach (sodium hypochlorite - 5.25% solution).

WARRANTY STATEMENT

APPLICABLE TO ALL PRODUCTS SOLD WITHIN THE UNITED STATES AND CANADA

Glastender, Inc. warrants all products to be free of defects in material and workmanship. One-year labor and parts warranty applies to all glasswashers, self-contained refrigeration models, and BDS model bottle disintegration units. In established areas, a start up is included with GT-24 and GT-30 model glasswashers. Warranty is effective for one year from the date of installation or up to 18 months from date of factory shipment, whichever occurs sooner. Glastender, Inc. will replace any part or assembly found defective under normal use and service.

For warranty labor claims beyond 15 months from the date of factory shipment, proof of date of installation or occupancy must be provided. Authorization for labor must be obtained from Glastender within the warranty period and prior to the service being performed.

Labor warranty applies to the United States and Canada only.

Remote refrigeration models and beer line chillers include a one-year parts warranty only. There is no labor warranty on these products.

Field replacement parts not covered under the original warranty include a 90-day part warranty from the date of installation.

FOUR YEAR ADDITIONAL COMPRESSOR WARRANTY: Glastender will warrant to the original user the compressor for all self-contained refrigeration models for an additional four years following the regular one-year warranty period. This plan applies to the compressor only.

A completed warranty claim form MUST accompany all returned defective parts or assemblies. Upon request, a defective part or assembly must be returned to Glastender, Inc., Saginaw, Michigan, with all transportation and delivery charges prepaid. Warranty repairs or replacements will be shipped FOB factory in Saginaw, Michigan. Reimbursement for applicable freight charges covers ground service only.

Glastender provides in-warranty repairs during a service company's regular working days and hours. There is no provision for payment of a premium rate during "overtime" hours. When warranty service is requested during other than normal working hours, the end user will be charged the premium portion of the overtime rate.

The warranty covers substantiated travel expenses for up to 2 hours / 100 miles round trip up to a maximum of $150. Any additional costs due to installations that require extra work, time, or travel to gain access for service are the sole responsibility of the equipment purchaser. Any exceptions to these travel and access limitations must be pre-approved by a factory representative.

The warranty does not cover equipment subjected to accidents, freight damage, alterations from the original design, improper power and/or plumbing hookups, improper chemical use, general misuse, or lack of routine required maintenance as determined by Glastender, Inc. Installation, normal control adjustments, general maintenance, correcting an installation error, or service calls that reveal the unit is functioning normally will not be reimbursed under warranty.

Condenser coils on self-contained refrigeration products must be cleaned regularly. Failure to provide adequate air flow to a refrigeration unit will void the warranty.

Glastender shall not be liable for loss of use, revenue, or profit, or for any other indirect, incidental, special, or consequential damage including, but not limited to, product spoilage or loss.

This warranty is conditioned upon Glastender receiving notice of any defect subject to this warranty within sixty (60) days of its discovery by the end user or dealer. All products are warranted only for the initial place of installation. Removal of a product automatically terminates this warranty.

SECOND YEAR EXTENDED PARTS & LABOR WARRANTY:

Glastender's one-year parts and labor warranty on self-contained refrigeration units, excluding beer line chillers, can be extended to two years with the purchase of a two year parts and labor warranty. Specify part number EWR2 ($150 net price) when ordering.

EXPORT WARRANTY - One year parts only.

EXCLUSION OF WARRANTIES

EXCEPT AS PROVIDED ABOVE, GLASTENDER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT.

LIMITATION OF REMEDIES AND DAMAGES
If Buyer makes a valid and timely claim as outlined above, Glastender's liability and Buyer's remedies under this agreement will be limited solely to labor charges authorized and/or replacement or credit, at Glastender's option, with respect to Products returned at Buyer's expense within thirty (30) days after warranty repair. GLASTENDER'S LIABILITY WILL IN NO EVENT BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE RETURNED PRODUCTS. GLASTENDER WILL NOT BE LIABLE UNDER ANY CIRCUMSTANCE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LABOR COSTS EXCEPT AS COVERED UNDER OUR WARRANTY, LOST PROFITS OR THE LOSS OF PERISHABLE PRODUCTS RESULTING FROM THE USE OF OR INABILITY TO USE OUR PRODUCTS OR FROM OUR PRODUCTS' INCORPORATION INTO OR BECOMING A COMPONENT OF ANY OTHER PRODUCT. NEITHER PARTY WILL HAVE ANY NEGLIGENCE OR OTHER TORT LIABILITY TO THE OTHER, OR TO ANY THIRD PARTY, ARISING FROM ANY BREACH OF THIS AGREEMENT.

GOVERNING LAW - JURISDICTION

The terms and conditions of an order are to be governed and construed according to the laws of the State of Michigan, without regard to conflict of laws principles. Buyer hereby consents to the jurisdiction and venue of the courts located in Saginaw County, Michigan.

No representative, distributor, dealer, or any other person is authorized to modify this warranty. This warranty replaces all other written or verbal warranties.

NOTE: Glastender, Inc.'s policy of constant quality improvement means that prices, specifications, and policies are subject to change without notice. Questions regarding this warranty should be directed to Glastender's Warranty Administrator.

01-12-16

IMPORTANT!!

Attention Service Companies

Please review the important warranty information on this page. If you believe a service call should be covered by the factory, please call the factory for authorization between 8AM and 5PM EST, Monday through Friday.

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