

Installation Instructions

Low-Energy Dishmachines

If you have questions, call 800-922-2178 or visit our website at: www.AmericanDish.com

BEFORE YOU BEGIN:

American Dish Service provides this information as a service to our customers. Keep all instructions for future reference. ADS reserves the right to alter or update this information at any time. Should you desire to make sure that you have the most up-to-date information, we would direct you to the appropriate document on our web site: www.americandish.com.

Set out below are the specifications and requirements that you must use and follow to properly install the type or types of equipment listed above. **It is your obligation as the customer to ensure that the machine is installed safely and properly, and when completed, the machine is left in proper and safe working order.** Electrical, Plumbing, and Chemical hookup must be performed by qualified personnel who will ensure that the equipment is installed in accordance with all applicable Codes, Ordinances, and Safety requirements. **Failure to follow these requirements will void the warranty. ADS assumes no liability or control over the installation of the equipment. Product failure due to improper installation is not covered under the ADS Warranty.**

WARNING:

Always disconnect power to dishmachine and tag out before servicing. Caution: Refer to chemical suppliers MSDS sheets for proper handling and chemical issues. Turn off machine at master switch before opening for inspection.

IMPORTANT:

Dishmachines are 120 volt and require a 20 amp (40 amp for 5AG double rack) clean circuit and suitable ground. It is recommended that new equipment be installed with new circuit breakers.

NOTE TO INSTALLER:

DO NOT OPERATE MACHINE WITH SPRAY ARMS INSTALLED UNTIL MACHINE IS FLUSHED WITH WATER.

Fill machine with water and run through one cycle without spray arms in place. This will flush installation debris from tank and pump and prevent damage to spray arm bearings.

Water Heaters or boilers must provide the minimum temperature required by the type of machine and a minimum recovery rate of 82 gallons per hour. The recommended temperature range for optimal performance is 130-140 degrees F. **Caution: Do not exceed water temperatures above 150 degrees F.**

All drains are gravity flow. Drain pipes must go downhill.

FOR YOUR SAFETY

Read and observe all **CAUTIONS** and **WARNINGS** shown throughout these instructions. While performing installations described in this booklet **APPROVED** Personal Protective Equipment, including **SAFETY EYE-WEAR** must be worn.

IMPORTANT- Dishwasher **MUST** be installed to allow for service of motors and scrap accumulator. If you receive a damaged dishwasher, immediately contact your dealer.

Optional Accessories -

Dishtables- Stock, straight tables up to 72" in length or custom designs available.

Pre-rinse Faucet & Sprayer
Dishracks

Booster - Model C-6 - Boost incoming water temperatures up to a 40 degree F. rise.

Electrical

Electrical Low-Energy Dishmachines - Single Rack Chemical Sanitizers

Important: The dishmachine master switch must be in the OFF position before connecting power. This switch is located on the back of the control box for all Top Mount machines and under the control box on Front Mount machines.

The power supply (120 volt - 20 amps) must consist of two (2) **10-12 AWG copper wires** and a suitable ground. The 20 amp breaker or fuse must be on a clean circuit to the machine. ADS has provided a junction box (for electrical hook-up) with a conduit hole for 1/2" conduit. This junction box is attached to the back of the control box, except the front mount AF and AFB, which is located on the left side of the frame next to the motor mount plate.

Remove the junction box cover and attach 120 volt supply wire (usually black) to black wire in the junction box. Attach the neutral wire (white) to the white wire in the junction box. Attach ground wire to the green ground screw located in the junction box and tighten all wires. Replace junction box cover.

Electrical for 5AG-S, 5AG - Front Mount, 5CD

5AG-S Double Rack Top Mount:

This dishmachine has two main/master switches. These are located on the back of the control box and face to the rear. These switches open or close the power supply to their respective motors; the right-hand switch controls the right-hand motor relay and the right-hand pump motor, the left-hand switch controls the left-hand motor relay and the left-hand pump motor. The right master switch (as you face the machine) controls power to the cam timer.

To DISCONNECT power to the machine, both switches must be toggled to the left as you are facing the machine's front.

5AG-S Double Rack Front Mount Control Box:

This dishmachine has two main/master switches. These are located under the control box and behind the chemical transfer tubes, they face down toward the floor. The right-hand switch controls the right-hand pump motor, the left-hand switch controls the left-hand pump motor. The left master switch (as you face the machine) controls power to the cam timer (control circuit).

To DISCONNECT power to the machine, both switches must be toggled to the left as you are facing the machine's front.

Single Connection-One (1) 40-Amp Circuit:

The power supply (120 volt - 40 amp) must consist of two (2) **8 AWG copper wires** and a suitable ground. The breaker must be on a clean circuit. ADS has provided a junction box (for electrical hook-up) with a threaded conduit hole for 1/2" conduit. The junction box is attached to the back of the control box for all machines except the 5AG Front Mount, which is located on the left side of the frame next to the motor mount plate.

Remove the junction box cover and attach 120 volt supply wire (black) to both black wires in the junction box. Attach the neutral wire (white) to both white wires in the junction box. Attach ground wire to the green ground screw located in the junction box and tighten all wires. Replace junction box cover.

Dual Connection-Two (2) 20 Amp Circuits:

WARNING: PUT A LABEL ON THE BUILDING'S CIRCUIT BREAKERS NOTING THERE IS A DUAL ELECTRICAL SUPPLY TO THE MACHINE.

Supply power to dishmachine using two (120 volt - 20 amp) circuits. The breakers or fuses must be on clean circuits to the machine. **Each circuit** must consist of two (2) **10-12 AWG copper wires**. Only one (single) suitable ground is required for power connection. ADS has provided a junction box (for electrical hook-up) with a threaded conduit hole for 1/2" conduit. Bring both power circuits and ground to this conduit opening. This junction box is located on the back of the control box for all except the 5AG Front Mount, which is located on the left side of the frame next to the motor mount plate.

NOTE: The use of solid color wires and red tracer wires started in 2/2003, the solid color denotes the control circuit wires.

5CD Corner Douber Rack:

This dishmachine has one main/master switch. It is located on the back of the control box and faces to the rear.

To DISCONNECT power to the machine, the switch must be toggled to the left as you are facing the machine's front.

The power supply (120 volt, 20-amp) must consist of two (2) **10-12 AWG copper wires** and a suitable ground wire. The 20-amp breaker or fuse must be on a clean circuit to the machine. ADS has provided a junction box (for electrical hook-up) with a threaded conduit hole for 1/2" conduit. This junction box is located on the back of the control box. Remove the junction box cover and attach a 120-volt supply wire (usually black) to the black wire in the junction box. Attach the neutral wire (white) to the white wire in the junction box. Attach the ground wire to the green ground screw located in the junction box and tighten all wires firmly. Replace the junction box cover.

Plumbing

Connect to Water Supply

Important: Always check for local plumbing codes before installing. Flush water lines before connecting to dishmachine.

Prior to plumbing the dishmachine, level machine by adjusting feet, at the bottom of each leg, up or down.

Water Heaters or boilers must provide the minimum temperature required by the type of machine and a minimum recovery rate of 66 GPH for L Series, 82 GPH for 3D Series and AF, 92 GPH for AFB, and 118 GPH for 5AG-S, 5AG, and 5CD. The recommended temperature range for optimal performance is 130-140 degrees F.

Caution: Do not exceed water temperatures above 150 degrees F. Residential hot water heaters are not sufficient for commercial application. Typical On-Demand or "Flash Heaters" do not have flow rates capable of supplying commercial dishwashers.

Connect 1/2" MPT water supply line to 1/2" FPT (Note 3/4" FPT on 5AG-S and 5CD) on the dishmachine's fresh water inlet manifold. Fresh water inlet manifold is behind control box on all models but the AF, AFB, and 5AG front mount, which manifolds are located on the lower frame. Supply water must be 120 degrees F. minimum (130-140 degrees F. recommended) from the primary heat source. The AFB requires 130 degrees F. Building source water pressure must be at a minimum of 15 PSI flow during fill (water solenoid open).

WARNING: Never use a 3/8" water supply line.

Water Pressure Problems: Water pressure below 15 PSI flow will require additional measures to resolve low pressure issues. To resolve water pressure problem, increase pipe diameter to 3/4" coming directly from hot water heater. If problem persists, suggest installing pressure bladder tank at 5 gallon minimum capacity. Another option would be to order the machine with a longer time cycle, allowing for longer fill time.

Drain Requirements for Upright Dishmachines

Follow local codes

Gravity drain line is 2"

Close petcock on wash pump before operating machine

Dishmachine scrap accumulators prevent clogged building drains. The scrap accumulator is accepted as an indirect waste interceptor (UPC (A)608 pg. 57.

Plumb dishmachine drain (1 1/2" FPT elbow or 2" FPT tee) located under sump to front of dishmachine scrap accumulator (connection is provided on some models). If scrap accumulator is free-standing (on legs) make sure this connection is running downhill to the scrap accumulator. Dual type (hanging) scrap accumulators must be attached to the frame of the machine before connecting drain (see "Dual" note). ADS provides scrap accumulators with a 2" drain outlet. Scrap accumulator drain outlets are either 2" pipe or 2" straight no-hub connection. No-hub connections are utilized when scrap accumulators must be removed for servicing of dishmachine. To prevent clogging, run drain line as straight as possible. Drain lines must be 2" diameter minimum. Do not plumb with tight elbows or 180 degree bends.

The use of floor sinks for draining can cause flooding. Always run gravity drain lines downhill.

Dual Scrap Accumulator Installation: Dual scrap accumulators come with an attachment slider bracket. This bracket can be attached on either side to the bottom perimeter of the dishmachine frame. Position slider bracket to frame with one angle facing up. This angle would be the side without bolt holes. Attach slider bracket to the frame, using the nuts and bolts (provided). After installing bracket, slide the Dual Scrap Accumulator onto the rail formed by the slider bracket and position accumulator flush with the front of the dishmachine.

Caution: Dishmachine scrap accumulator is not a sewer gas trap.

Control System Set-Up

Cam Timer Adjustment

Timers are available with 6,7, or 8 cams .
Cycle time is not adjustable

Timer cams (wheels) are fixed or adjustable. Each cam controls a specific function, as noted on the timer decal. Adjustable cams are comprised of two (2) wheels. The outer edge of each wheel (half) has a high and low segment. When the wheels are rotated, the two low segments can form a notch. Above each cam is a timer switch with a metal finger that rides on the cam. When the finger drops into the cam notch, the function of that cam begins. To widen (length = time) or close the notch, use timer adjustment tool (provided). This tool has two (2) raised buttons that fit into the holes on each wheel. The factory sets the start of each function using the right-side of the cam. **TO ADJUST rotate only the left-side cam wheel. The left-side of the wheel controls when that specific functions stops.**

#1 Cam: The white cam on your left is the master cam. It controls the total time of the cycle and is not adjustable.

#2 Cam: Continuing left to right, this black cam controls detergent. The detergent cam is adjustable.

#3 Cam: This white cam controls the drain. No adjustment is available.

#4 Cam: The H2O or fill cam opens the water solenoid. Too little water causes the pump to cavitate. Overfilling does not allow all the water to drain between cycles, causing carry-over. Do not move the right side of the cam wheel. Adjust left-side of cam wheel to close water solenoid when the dishmachine reaches full sprayarm pressure.

#5 Cam: This black cam controls sanitizer. The sanitizer cam is adjustable. Set sanitizer concentrations at 50 parts per million (Warning: Do not exceed 100 PPM's). Monitor chlorine levels by using chlorine test strips. To Test: Run rack of dishes through a complete cycle, use test strip to test water sample from the top of any glass.

#6 Cam: This black cam controls rinse additive. The rinse-aid cam is adjustable.

#7 Cam: This cam is used to pause or "burp" the pump on the 3D-S, 5AG-S, 5CD, and L Series. It is set at the factory but can be adjusted.

#8 Cam: Available on 2 1/2 minute timers only. Provides prewash/wash/rinse. Do not adjust.

Machine Tuning

Tuning is essential for proper cleaning
Do not skip this IMPORTANT PROCEDURE

The key to understanding proper tuning, is to realize that you cannot control or change the drain. It is a fixed function. Therefore, all tuning is accomplished by setting or adjusting the fill cam in relationship to the fixed drain cam. The goal of tuning is to eliminate all soiled water, through the drain, before the fixed drain closes.

A sign that soiled water has exited the tank will be the typical hollow sound of a pump running without water. It is at this point that you want the water solenoid to come on. That function is controlled by the adjustment of the fill cam. For optimum results, allow the fill water to flush the interior of the machine for a few seconds before the drain closes.

Once the drain is closed the fill cycle begins. Fill must continue until full spray arm pressure is reached. This can be verified with the use of a spray arm pressure gauge attached to the lower wash arm end plug. This gauge will indicate full spray arm pressure when the needle stops fluctuating and remains steady. Adjust your fill cam to turn the water **OFF** when you reach this point of steady pressure. To satisfy code, a minimum of seven (7) seconds of full rinse pressure (with chlorinated water) is required. Sanitizers should be injected during the second half of the fill cycle.

If a pressure gauge is not available, an approximation of full spray arm pressure could be determined by the sound of the spray arms. There would be a typical continuous swishing sound of the water spraying. Again, this would be the point to turn the water **OFF**.

Important Note: Seven seconds of full spray arm rinse pressure is required by code. In the event that air is trapped in the pump during fill, a vapor lock can occur. If vapor locked, check incoming water temperature and reduce to 120 degrees F. minimum (130-140 degrees F. recommended). If the problem is caused by low water pressure to the machine, see plumbing instructions to correct condition. If vapor lock is still present, electrically stop or pause the pump to release air. This is done by moving the brown wire on the back of the switch behind sanitizer cam. Move this brown wire, which is currently on the top position of the switch, to the center position **taking care that wires do not touch**.

Warning: You must wear approved Personal Protective Equipment, including SAFETY EYE-WEAR before connecting chemicals. Chemicals can destroy the plumbing and stainless of the dishmachine. Do not run chemical lines over controls or plumbing. Always secure chemical lines and check regularly for leaks.

Chemical Dispensers

ADS provides three (3) peristaltic pumps to dispense liquid chemicals
Chemical feed lines are color coded "**Red**" Detergent, "**Green**" Sanitizer, "**Blue**" Rinse-aid
Pick-up tubes are provided for chemical product containers
Sanitizer (chlorine) settings at 50 parts per million

Caution: Use only commercial grade low-energy chemicals. For proper operation, use non-foaming detergents and buffered sanitizers. Do not wash gold, pewter, silver, or silverplate with chlorine based sanitizers. High concentrations of chlorine sanitizers and caustic detergents will cause damage to metals and welds. Do not exceed 100 parts per million (PPM) free chlorine.

Place color coded tubes into proper chemical containers. The containers need to be as close to the machine as possible. This may require shortening of the flexible chemical transfer tube. On the control box, there are chemical prime switches. There is a decal identifying each switch. To prime chemicals use these momentary prime switches, verifying that all three pumps rotate. If a chemical pump squeeze tube has taken a set (not allowing the pump to turn), manually free the pump by pulling on the discharge side (right-hand) of the squeeze tube while pushing the prime switch.

Chemical dispensing is controlled by a mechanical cam timer. All chemical products must be adjusted for product's concentration and local water conditions. It will be necessary to adjust initial factory setting (See Cam Timer Adjustment Section). Water softeners should be added to correct hard water conditions. Hard water can be treated with expensive chemicals, but it is more effective and less expensive to soften the water before it comes to the dishmachine.

Solid Chemical Products: ADS offers certain models with solid chemical dispensing for detergents and rinse additives. These dispensers are mounted on the hood, in front of the control box. Each dispenser is controlled by a water solenoid that is mounted in place of the liquid peristaltic pump. The initial signal comes from the cam timer. An optional metering relay is available for high concentration rinse additives. Cold Water Products require a separate water line connected to the 1/4" female compression fitting (provided). Hot Water Products require no additional plumbing.

Final Installation Check List

Check to be sure power is **OFF**. The master switch is located on the back of the control box for all Top Mount machines, under the control box on Front Mount machines, and on the side of the control box on Undercounters.

Open door and remove all packaging, save all instructions for future reference.

Remove protective film if present from doors, front panel, and control box.

Check dishtable placement, correct any binding or pinching caused to the dishmachine door guide by dishtables.

Turn on water supply. Check for leaks. Tighten connections if needed.

To operate, turn on main power circuit breaker and switch dishmachine master switch to **ON** position.

Remove spray arms and manually fill the machine with water using the fill switch (labeled **FILL**). This switch is located on the side of the control box. Run one complete cycle by closing the doors (optional auto/start machine only) or pushing the start switch (labeled start). This is your **flush cycle**, which removes installation debris from wash tank and pump. After flushing, re-install the spray arms. These arms are interchangeable. **Failure to follow this procedure can damage spray arm bearings.**

Observe the water level decal. This decal is located on the outside of the sump area next to the drain tube of the machine. This mark is the approximate level for initial fill.

Verify incoming water temperatures 120 degrees F. minimum, 130 degrees F. for the AFB (130-140 degrees F. recommended). **Caution: Do not open doors while machine is in cycle. Doing so may result in personal injury.**

Inspect sump area and verify pump filter is in place.

Verify that chemical feed lines are in their proper container and that lines are primed.

Post an operational wall chart close to the machine.