

Frequently Asked Questions (ADS Conveyor & High Temp Dishmachines)

“What is the dishmachine’s operation—how does it work?”

Operation: Be sure all the screen filters, drain stoppers, spray arms, and curtains are put in their correct place. Turn on the master switch located on the side of the control box. The machine will fill automatically. Prepare a rack of soiled dishes and push the rack into the machine. The conveyor will start automatically and push the rack through the wash and rinse sections then exit the other side.

The HT-25 single rack door machine will start when you close the door. The HT-25 will begin a timed wash cycle, the wash motor stops and the final rinse solenoid will spray clean heated water for 10-seconds, ending when the indicator lights turn off.

Installation Errors

Installation errors account for a high percentage of all service calls and questions. Please refer to the ADS **Installation Instructions** for specific models. These documents are available on-line at (www.americandish.com) and also come with each new machine. They can be emailed or faxed during normal working hours. Electrical requirements, plumbing needs, control adjustments, cautions, and start up information are contained in the Installation Instructions.

Category 1, ELECTRICAL WIRING ISSUES

“Why did the wire burn at its connection?”

A burned wire with black or green colored copper and the insulation melted back an inch or two indicates a loose connection, looseness creates resistance, electrical resistance produces heat. Over time this heat will melt and char plastic insulation. The heating source will be located at the end of the burned wire or the connection point. A burned wire can also come from a shorted switch that causes the same resistance as a loose connection.

“What size wire should I use to power the machine?”

The manufacturer recommends NEC wire codes--or better. For a 208v, 60-amp machine, minimum 6 gauge wire is recommended.

“Can you use a fuse instead of circuit breakers?”

Yes, as long as it is a 60-amp fuse for a 44-inch conveyor III-phase, 90-amp for a 66-inch conveyor three-phase, or 50-amp for an HT-25, three-phase w/ booster. See Installation Instructions for single-phase equipment.

“Can the machine be plugged into an outlet like a household dryer?”

The answer is no. According to electrical code, 60 amp service needs to be connected and hard-wired using screw/terminals to its own circuit breaker. Further, Underwriters Laboratory and building code require the circuit breaker to be clearly labeled “dishwasher.”

“Why does the circuit breaker keep tripping after the machine runs for a while?”

Circuit breakers become weaker as they are repeatedly tripped or if they are hit by an unusually strong short. Consequently, a breaker can begin 'nuisance tripping' and should be replaced. Another cause can be a motor or heater that is getting ready to fail.

Wires that have melted and allow current carrying load to come close to the neutral or other phase will trip a breaker. (To verify, take the wires out and separate them. If they are stuck together that means they have melted and should be replaced.) When copper burns, microscopically the metal becomes porous and has more resistance than solid wire—and will burn again.

“Why does the circuit breaker trip as soon as I turn on the machine?”

This usually indicates a serious short, a grounded circuit, or a crossed phase. For a 60 amp breaker to trip so violently would indicate a powerful contact such as a grounded motor or solid connection to neutral has occurred.

“Machine runs on all the time, why?”

HT-25: Lift the door to see if it will stop. If it does NOT stop, the problem is a faulty door switch. If it does stop, the problem is likely the 'Auto-start' relay. You can test by removing the yellow wire for terminal #1 and run a cycle. If the machine turns off normally at the end of the cycle, the problem is a faulty relay and should be replaced (P/N 091-3059). A failed "start" push button, de-lime switch, or the master (on/off) switch on the cam timer can also cause this problem.

CONVEYORS: If the machine continues to run after racks have exited the machine, the likely cause is a stuck or failed tray-track REED SWITCH. These are located just outside and under the wash and rinse tanks. The magnet that is attached to the tray track and is suspended from the front rail hangs directly over each reed switch. The switch is "normally closed" and the magnet's influence is the only thing that will turn off the conveyor and pumps.

ADS provides wire diagrams on the various models for troubleshooting electrical problems. Go to americandish.com to download technical and electrical diagrams.

Category 2. MACHINE FUNCTION ISSUES

PUMP PROBLEMS

“Why is the pump filter being clogged with string fiber?”

Historically string fiber in the pump filter comes from washing mop heads and bus towels in the dishwasher. However, this practice introduces floor bacteria to the internal parts of the machine and is difficult to remove without complete disassembly. These kinds of bacteria and soils cause sickness and can be deposited on clean ware. **Operators should be warned to not use the dishwasher in this way. It also creates mechanical problems in manifold, seals and spray arm systems.**

“The pumped rinse sprays are only coming up 6” on the bottom and not rinsing the inside of the glasses?”

That is the correct operation for the "water-curtain" pump. The only purpose of the lower spray arm is to rinse off the bottom of the rack so final rinsing can take place more easily. If the lower

arm of the water curtain were to spray with higher pressures, the water would layover the top of the tank divider and pump out the water in the rinse tank. This would cause the machine to re-fill, which turns off the heater and takes away the final rinse pressure.

Another possible cause is when the spray arm deflectors tabs are bent over (from operators banging the arm on trash cans) causing a jet of water to spray into the wash tank. This results in no heat, no final rinse pressure on the clean end and high water and chemical usage. Bend the deflector back so it is facing straight up and down and check the sprays are likewise.

PUMP MOTORS

“The wash pump motor keeps tripping the overload?”

This is an indication that the motor is having a problem or there is a loss of one phase in the electrical power. Testing the amp draw of the pump motor should run balanced with approximately 8 amps on each of the three legs for three-phase. For single-phase the motor would draw about 12-15 amps on both legs. Before changing motors, verify the electrical supply is correct. Some work in the building could have caused one leg of power to be missing. This missing leg is a common cause for a tripping an overload and is often overlooked.

“I replaced the motor, but it still trips the overload?”

The existing overload could have been damaged by the prior problem with the motor, especially if it was reset many times before the new motor was installed. It is a good practice to replace the overload whenever a motor is replaced.

“I put on a new pump motor. Now the new pump is making a lot of noise and there is no pressure in the wash?”

For three-phase motors, there is a 50/50 chance of connecting the wires incorrectly and having it run backwards. Switch any two wires at the motor and it will reverse rotation and the pump will operate quiet. It did not hurt the motor.

TANK HEATERS

“How do I increase the temperature for the tank heater?”

The thermostat is located in the same box as the heater terminal. It is a cartridge type thermostat with a center rod control. With a screwdriver, turn the center rod to the left (counterclockwise) to increase temperature. It has a range of 100° below to 500° above zero. Turn until the thermostat light (located next to the heater relay) comes on. Observe the dial thermometer and move the center rod until you reach the correct set point. Typically 163°-on to 168°-off for high temp tank heat. Same is true for the rinse tank.

“Will mineral build up on the heating elements hurt them?”

Yes. The mineral buildup acts as insulation, thus shortening the heater's life and also reducing the heating energy that can be put into the water.

“The conveyor can't seem to keep up the tank temperatures, can it be fixed?”

EVERYTHING TAKES HEAT AWAY. The only thing that will sustain the water temperature in a tank of water being sprayed into the air is the kW in the element itself. All of the following cause cooling of the tank temperatures.

If the voltage is low (200v) kW is less and water takes longer to heat, use heater rated 200/208v

If the curtains are missing, cooling takes place

If plastic trays are being washed rack after rack, they hold the curtains open

If cooling fans are running in the room, they will cool the sprays

If venting fans are over 800-1200 CFM, they will cool the sprays

If water is draining down the table, the tank heater will be turned off during fill

If there is calcium build up on the heater element, heat will be lost

If the heater is faulty, a loss of kW results. A heater has a finite life like a light bulb

If the thermostat set point is adjusted low, it will not catch up

If the tank thermometer is not calibrated accurately, the thermostat set point could be in error

If final rinse temperatures are low, they will cool the whole machine.

You will need an accurate amp gauge and digital thermometer to troubleshoot heating problems.

SPRAY ARMS

“Why is water spraying out of the top of the doors or out of the sides onto the tables?”

A missing or bent spray arm end cap allows water to rush out of the spray arm, causing splashing out of openings on the machine.

“Why does the end cap fit so loose, it falls open?”

For the captive endcaps, this happens when the cap latch has been forced shut over seeds or toothpicks, over time it loosens up. Look at the cap end-wise (the coin edge). It should be straight. Bend with an adjustable wrench the small tab so it is straight with the coin edge, and the latch will snap tight again.

FILL SOLENOID

“Will the machine fill and shut off automatically when I turn the machine on?”

The answer is YES; it will fill automatically when it is turned on. Any time the tank water level drops below the bottom of the tank “float” the machine will turn off the tank heaters and turn on the fill valve. When the top of the float is covered, the switch will turn off the water and turn the heaters back on.

“The machine is filling all the time, what is the cause?”

The “float” in the ADC conveyor and HT machines actually will not float. They are heavier than water and will sink. They work according to specific gravity, when submerged in water; they become light enough for the return spring in the float switch to lift the weight. There is no maintenance or adjustment to the system.

If there is a fault, repairs consist of #1 replacement of the ADS switch (P/N 291-3014 only, similar looking switches will not work), #2 replace the “float” or #3 removing anything that interferes with the rod holding the weight—like buildup inside the protecting tube. With the machine full, test by flipping the lever that pushes against the switch button 5-10 times, should never stick on. If it

does, refer to the three repairs above. There are two switches on the conveyor, either one turns on the single fill valve.

“Why won’t the machine fill with water when I turn it on?”

If there is no “fill” water coming in, it can be a result of an electrical problem from a faulty switch, loose wire, or a failed coil. Test at the fill coil’s two electric wires to see if there is 115v when the machine is turned on and tanks are empty, if there is voltage, the problem is a bad coil. Or it can be a result of no water supply to the machine, check to see if the valve has been turn off.

“Why does it take so long to fill the machine?”

Reasons for slow filling can be clogged or undersized piping (1/2” pipe min, recommend ¾” pipe), restricted pipes, faulty PRV (pressure regulator valve), water heater type, and the facility’s water pressure problems. Tankless or on-demand water heaters are not recommended for commercial dishmachines because of restricted pressure and long fill times.

“What should we do if the incoming water is too cold?”

If the water heater is too far away, pipes need to be insulated. If the heater is not sized for the demand, it needs to be up graded. If it is turned down too far, it needs to be set up (120°F min at the machine).

“How do I adjust the fill so all the tanks fill up on a 66 or 44?”

There is a diverter plate located inside the wash cabinet, near the center at the top. It is mounted on two studs and has slotted holes. Loosen the two nuts and it can slide left or right. Place the diverter so it just interrupts the incoming water stream enough to separate a small jet of water about the size of a pencil. This jet of water will follow the plate and flow into the rinse tank. When the rinse tank is the last tank to fill up, that will mean the overflow from wash and rinse tanks will fill the last tank (power scrapper tank) of the ADC-66 before shutting off the water. This is the same procedure for setting the adjustment on the ADC-44.

FINAL RINSE SOLENOID

“How much pressure should be indicated on the gauge when the final rinse is spraying?”

The requirement is a minimum of 20 psi and a maximum of 25 psi. Pressures that are near 30 psi will overcome most peristaltic feeders and prohibit chemical dispensing into the final rinse manifold.

“The pressure gauge reads 65 psi, but when it goes into final rinse the pressure will drop to 15 psi, there is plenty of pressure in the building, why does it drop so much when connected to the ADC-44?”

The 65 psi is simply the building’s static pressure. That means, when all openings are closed to the building’s water pressure—the source (municipal utility), is providing that much pressure to the local water system. Like a balloon filled with air and a knot tied in the end.

When a tap is opened or a valve is opened, it is like taking the knot out of the balloon and all the air is forced out under pressure. This is called flow pressure, the force the balloon can expel

when opened. The flow pressure is always lower than the static pressure (when the knot is closed). The larger the opening, the lower the flow pressure.

When there is a significant drop in flow pressure, from static—it means the opening is large compared to the pipe (balloon) and the pressure is dissipated too quickly. When the pipe or branch line feeding the fixture is sized correctly and when it is a clean line, appropriate flows can be maintained by the utility.

Quick Notes: Run ¾" or larger copper pipe supply lines to commercial conveyor dishmachines directly from the water heater. Do not branch off this line for sinks or tables. Replace old pressure regulator valves (PRV), existing booster heaters may be corroded at inlet and outlet openings, and the actual piping may be corroded inside to half its original ID. Tankless or on-demand water heaters are not recommended.

"The chemical dispenser needs a signal for the final rinse; can the final rinse solenoid voltage be used to power the dispenser?"

The answer is no.

There are wash and rinse signal terminals provided in the control box for dispensing equipment and clearly marked with yellow decals. These are the safe sources for a signal. The fill and final rinse solenoids run off the machine's transformer supplied control voltage. This power only has a one amp capacity, which is fully used by the machine. Using the internal 120v control voltage to power a dispenser or ventilation fan will result in machine electrical failures and can void warranty claims.

Category 3. GENERAL QUESTIONS

"How do I turn 'on' the machine?"

There is a master switch located on the side of the control box. Once this has been turned on, the machine will begin to fill, if it is empty. After filling is completed (water will start flowing into the scrap box located on the soil table side) slide a dishrack into the machine to start the wash cycle. When the rack travels through the machine and exits the other side that will complete the process.

"The machine did not turn on, what do I do next?"

Check the circuit breaker. Push in the roller on the door switch plunger on the front inspection door of the machine. Look to see if a rack is sitting against a table limit switch on the clean table. Check the master switch to see if it will operate. If these quick answers don't work, it will require a service call.

"The Conveyor keeps running when the racks are taken out?"

The cause is likely something interfering with the tray-track switches located on the front tray track. Look for a bowl or plate trapped behind the tray track, holding the suspended magnet tube away from the bottom.

If the magnets are hanging freely at the 6:00 position and about 1/16" off the bottom, the problem will be a faulty REED SWITCH or misalignment of both magnet and switch. Test by using a large magnet (one strong enough to pick up a screwdriver). Put it up to the reed located on the underneath side of the wash or rinse tanks near the front corners of the machine. If the machine turns off, the switch is okay and the problem will be alignment of the inside magnet and the switch

mounted outside. The switches are 'normally closed' and different from typical reed switches used by others.

CHEMICAL FEEDERS

ADS Conveyors and the High Temp door machine require commercial chemical feeders or dispensers. If you are using the machine as a chemical sanitizer, that requires a three-product dispenser. If you are using the machine for high temperature sanitizing, a two-product dispenser is needed. Installation and service questions of the feeder units are referred to the manufacturer.

PLUMBING DRAINS

"If there is a grease trap but the machine drains are just a little higher than the trap, can it still be used to connect the dishmachine drain?"

The answer is no, water only drains down hill. When this rule is not followed, it results in leaks and foul smells.

"If there is a wall drain but the machine drains are just a little higher than the wall drain, can it be used to connect the dishmachine?"

The answer is no, water drains down hill. For a wall drain you must install a trap to prevent sewer gas from entering the room through the pipe. This will bring your wall drain access even lower. Typical access points for drains on conveyor and high temp equipment is 8" off the floor.

"The drain discharge on the machine is on the opposite side of the machine from the building drain or the building drain is under the machine, can I make a few "U" turns to reach the building drain?"

NO, tight bends in piping is not recommended. The soil load will clog the drain line at the 90-degree elbows; straws and toothpicks create "nesting" and cause repeated service calls and flooding. Clean outs are needed if tight 90s are used in the drain plumbing.

"What size drain line can I use on a conveyor or high temp door machine?"

Use 2" pipe or larger. Never use reducers and always drain to larger diameter pipe.

"Can I use "FLOOR SINKS" for Conveyor or HT tank drains?"

Yes, but caution should be used. Make certain the drain is free running and a "deep" floor sink is used (no shallow types). When the machine is emptied, 15 gallons will come flooding out all at once. Test before you commit.

LEAKS

"Why is water leaking out of the pump next to the motor?"

It is because of a failed pump shaft seal. The next question is “But I just put a new one in.” It may have been put in dirty, facing the wrong way, or seated improperly in the housing. The seal may have been cracked or chipped prior to or during installation. Use some liquid dish soap to re-assemble, do not use grease or oil.

“Why is water spraying out of the door or on to entrance and exit tables?”

Check for missing or open spray arm end caps.

DOOR ARM ISSUES (HT-25 only)

“Why is the door hard to raise and will not stay up?”

The metal door guides could be bent inward by the table causing binding on the door. Using a screwdriver, carefully pry the guide out to give adequate clearance. The door guides could be out of alignment. Adjust the rearward guides so they are parallel with the front guides. Or the door springs could be tensioned too little. Adjust the nut on both door spring eyebolts to give more tension.

Caution: take the tension off the eye bolt and nut (by pulling down on the spring) before trying to turn. Otherwise it is likely to gall the stainless threads when turning the nut, this mistake usually requires cutting off the eye-bolt and nut.

“Why won’t the door stay closed, it rises a little after the machine begins to run?”

This means the tension on the door springs is too great and should be adjusted for less tension.

Caution: take the tension off the eye bolt and nut (by pulling down on the spring) before trying to turn. Otherwise it is likely to gall the stainless threads when turning the nut, this mistake usually requires cutting off the eye-bolt and nut.

“Can I disconnect one of the doors on the HT-25 so we don’t get the floor or wall wet?”

The answer is NO on the door. That will cause an imbalance in the door arm. If a shield is needed for one door, ADS offers an inside shield that can be installed (# 387-6019 –splash plate).

Category 4, REGULARLY PERFORMED PROCEDURES

END OF SHIFT DUTIES

“When I change chemical buckets, do I have to prime the lines again?”

Yes. Always prime the supply so chemical is available for the next cycle.

“How often do I have to clean out the pump filters, spray arms, or scrap box tray?”

They should be cleaned after every meal period

“Does the machine need to be turned off at night?”

Yes. Always turn off electrical equipment when not in use or when the facility is closed.

“Can they wash their floor mats in the dishmachine?”

No. The floor mats carry floor bacteria and soils into the dishmachine. This should never be done in a machine used for cleaning public eating utensils. The practice of washing floor mats or mops in a commercial dishmachine is prohibited by FDA Food Code in section 6-501.15

“Can the dishmachine be washed down during clean up?”

No, it is considered electrical equipment. While it is true the inside tank can be washed out with a hose, the **machine itself cannot be safely hosed down with water or sprayers.**

“How do I ‘de-lime’ the machine?”

This treatment should ONLY BE PERFORMED BY TRAINED AUTHORIZED PERSONNEL. The addition of de-scale acids, if chlorine sanitizer is present, can produce hazardous gas. The HT-25 machine has a de-lime service switch locked inside the control box. The machine should be drained, clear water added and then the de-lime switch turned on (which only runs the pump). At this point, the acid product can be safely added to the water by pouring into the tank. **Refer to the printed instructions on the bottle for dilution rates. Caution: do not let acid sit in the machine unattended or overnight.**

Category 5, “RESULTS,” OR WHY MY DISHES DID NOT COME OUT CLEAN?

“Why are the glasses and silverware coming out with streaks and filmy appearance?”

The dishmachine does not produce white liquid or grease. So, if clean heated water (120°F min) is supplied to the machine, chemicals adjusted correctly, and the five machine functions of the machine are in place (start, wash spray, heat water, convey, rinse spray) —the problems come from procedure or water conditions. Rub the glass with fingers; if the film runs or feels greasy, it is likely a build up of grease and fats. Check temperatures and detergent settings. If cloudy substance or film disappears after placing a glass half way in a bowl of delime acid, it comes from supply water minerals and must be treated separately.

“Why are the glasses coming out with specs on them?”

Specs that show up on glassware when they are still wet are actually very small particles that are magnified through the curvature of water. These specs are usually food soil carry-over, though sometimes faulty water softeners and boiler equipment can send particles through the final rinse.

A typical dishwasher can assimilate approximately 60 ml of soil solids per batch or rack. More than this saturates the wash and rinse actions leaving specs inside and on dishware. This comes from poor pre-scraping procedures.

“Why are black marks showing up on the plates?”

There is nothing in the machine that makes black. Carbon black is the source of black specs and comes from grill or hood filter parts. There are professional services that clean these kinds of parts. They should never be clean in a dishwasher. Once the carbon black is inside of the

machine, it is costly to remove it. Cleaning hood filters or stove parts in a dishmachine is prohibited by FDA Food Code section 6-501.15.

Note: Plates that have lost the porcelain finish from stacking abrasion will have a dull white appearance at the point of contact. This is the base ceramic material and is easily marked, just like chalk. The carbon black will turn this ceramic grey or black. The answer is the plate should be replaced for sanitary reasons, and grill components should not be washed in a dishmachine.

“Why are stem-ware glasses breaking in this dishwasher?”

Wine glasses have a weighted base and tip over easily when they are upside down, especially the popular slim, tall glasses. The washing process requires mechanical action (spraying), temperature, chemicals, and time. In an automated dishwasher, specific racks are made with compartments to hold the glass upright—they are called glass racks. They are sized for the various styles of stem ware. Glasses should not be washed using peg racks or flat racks.

“Why is my machine foaming?”

Low water temperature (below 120°F) will cause the rinse aid chemical to foam. Use the least amount of rinse agent to obtain sheeting on glassware. Temperatures of 130-140F are recommended. This will make your detergent more active and do a better job of cutting grease and food soil. This higher water temperature will also shorten drying time.

Category 6, TABLES FOR CONVEYORS

“The soil table is too high and we can’t lower it to attach to the machine, racks are pushed in but the machine won’t start, we can’t raise the machine any higher?”

The table is made to serve the machine process.

Existing tables may not be suited for new equipment and require replacement.

The dish racks must travel smoothly from soil table through the machine and onto the clean table to have a successful conveyor installation.

ADS Installation Instructions state on the first page that tables must rest on the machine lip and be secured to the conveyor by bolting in place. This is required for smooth conveyor operations.

“The conveyor machine is installed in a small room, it has a short ‘L’ table on the clean side with a half-round band for turning the racks, BUT they always stick half way and bunch up, how do I make them go all the way around like they are suppose to?”

Unfortunately, you are talking about making a square rack go through a round hole (or bend, it is the same physics). And that one account you’ve seen or heard about will not help you here. It is a matter of the rack turning in the diamond shape when the next rack pushes against it. That is when everything bunches up and comes to a stop—approximately $\frac{3}{4}$ of the way into the arc. You can spend time and money trying to make this work, but in the end you will learn what everyone else has, an employee will have to stand there and pull the racks around. The high number of tables with these existing bands in the market place does not make the physics any less real.

It is recommended that on a very short conveyor clean table, a table limit switch be added on the end and the band removed. This solution will cause less wear on the conveyor clutch parts.

“The soil table has a pre-rinse sink right next to the entrance and the machine is always turning on the fill solenoid, the chemical usage is very high, what can I do to stop this?”

All the water that comes out onto the soil table is draining down the pre-rinse sink’s drain and is lost. The machine senses the empty wash tank and turns off the heaters for safety and turns on the fill solenoid. This action removes heating and takes away city water pressure—two of the most important needs for the cleaning process. This problem affects all equipment with open ends (conveyors).

Solution: The ADS installation Instructions and spec sheets clearly indicate that the minimum distance of any sink or drain to a conveyor table is 20” or the length of one rack.

“How do I treat rust stains on stainless steel?”

When iron or carbon steel particles come in contact with stainless sheet metal or other stainless components, the rust oxides can attach to the stainless surfaces and begin to corrode. High concentrations of chlorine accelerate the oxidation. If this is left unchecked and untreated, the rust will damage the structure of the stainless metal. Clean all rust stains and hand buff the metal clean and shiny with a fiber abrasion pad. Never use “steel wool” scouring pads to clean stainless. Treat with de-lime products after cleaning stains.