

AD-310

(Gas and Steam)

1 Auto Door/2-Way Tilt Operator's Manual

WARNING: For your safety the information in this manual must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury or loss of life.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WHAT DO YOU DO IF YOU SMELL GAS

- * Do not try to light any appliance.
- * Do not touch any electrical switch; do not use any phone in your building.
- * Clear the room, building or area of all occupants.
- * Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- * If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.



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Retain This Manual In A Safe Place For Future Reference

American Dryer Corporation products embody advanced concepts in engineering, design, and safety. If this product is properly maintained, it will provide many years of safe, efficient, and trouble-free operation.

ONLY properly licensed technicians should service this equipment.

OBSERVE ALL SAFETY PRECAUTIONS displayed on the equipment or specified in the installation/operator's manual included with the dryer.

WARNING: UNDER NO CIRCUMSTANCES should the door switch or the heat circuit devices ever be disabled.

WARNING: The dryer must never be operated with any of the back guards, outer tops, or service panels removed. PERSONAL INJURY or FIRE COULD RESULT.

We have tried to make this manual as complete as possible and hope you will find it useful. ADC reserves the right to make changes from time to time, without notice or obligation, in prices, specifications, colors, and material, and to change or discontinue models.

Important

For your convenience, log the following information:

DATE OF PURCHASE _____ MODEL NO. **AD-310**

DISTRIBUTOR'S NAME _____

Serial Number(s) _____

Replacement parts can be obtained from your distributor or the ADC factory. When ordering replacement parts from the factory, you can FAX your order to ADC at (508) 678-9447 or telephone your orders directly to the ADC Parts Department at (508) 678-9010. Please specify the dryer **model number** and **serial number** in addition to the **description** and **part number**, so that your order is processed accurately and promptly.

INSTRUCTIONS TO BE FOLLOWED IN THE EVENT THE USER SMELLS GAS MUST BE POSTED IN A PROMINENT LOCATION. THE INSTRUCTIONS TO BE POSTED SHALL BE OBTAINED FROM THE LOCAL GAS SUPPLIER.

IMPORTANT

YOU MUST DISCONNECT and LOCKOUT THE ELECTRIC SUPPLY and THE GAS SUPPLY or THE STEAM SUPPLY BEFORE ANY COVERS or GUARDS ARE REMOVED FROM THE MACHINE TO ALLOW ACCESS FOR CLEANING, ADJUSTING, INSTALLATION, or TESTING OF ANY EQUIPMENT per OSHA (Occupational Safety and Health Administration) STANDARDS.

CAUTION

LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING THE COMPUTER BOARD and THE IGNITION MODULE. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION.

CAUTION

DRYER(S) SHOULD NEVER BE LEFT UNATTENDED WHILE IN OPERATION.

WARNING

The dryer must not be operated with any of the front and/or rear control doors, side access doors, or service panels removed. PERSONAL INJURY COULD RESULT.

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPOR AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

DO NOT DRY MOP HEADS IN THE DRYER.

DO NOT USE DRYER IN THE PRESENCE OF DRY CLEANING FUMES.

IMPORTANT

PLEASE OBSERVE ALL SAFETY PRECAUTIONS displayed on the equipment and/or specified in the installation/operator's manual included with the dryer.

Dryer(s) must not be installed or stored in an area where it will be exposed to water and/or weather.

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SAFETY PRECAUTIONS

WARNING: For your safety, the information in this manual **must be** followed to minimize the risk of fire or explosion or to prevent property damage, personal injury, or loss of life.

WARNING: The dryer **must never be operated with any of the base panels, tilt guards, or side access doors removed. PERSONAL INJURY or FIRE COULD RESULT.**

1. **DO NOT** store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
2. Purchaser/user should consult the local gas supplier for proper instructions to be followed in the event the user smells gas. The instructions **should be** posted in a prominent location.
3. WHAT TO DO IF YOU SMELL GAS...
 - a. **DO NOT** try to light any appliance.
 - b. **DO NOT** touch any electrical switch.
 - c. **DO NOT** use any phone in your building.
 - d. Clear the room, building, or area of **ALL** occupants.
 - e. Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - f. If you cannot reach your gas supplier, call the fire department.
4. Installation and service **must be** performed by a qualified installer, service agency, or gas supplier.
5. Dryer(s) **must be** exhausted to the outdoors.
6. Although ADC produces a very versatile machine, there are some articles that, due to fabric composition or cleaning method, **should not** be dried in it.

WARNING: Dry only water-washed fabrics. **DO NOT** dry articles spotted or washed in dry cleaning solvents, a combustible detergent, or "all purpose" cleaner. **EXPLOSION COULD RESULT.**

WARNING: **DO NOT** dry rags or articles coated or contaminated with gasoline, kerosene, oil, paint, wax. **EXPLOSION COULD RESULT.**

WARNING: **DO NOT** dry mop heads. Contamination by wax or flammable solvents will create a fire hazard.

WARNING: DO NOT use heat for drying articles that contain plastic, foam, sponge rubber, or similarly textured rubber materials. Drying in a heated basket (tumbler) may damage plastics or rubber and also may be a fire hazard.

7. A program **should be** established for the inspection and cleaning of lint in the burner area, exhaust duct work, and inside the dryer. The frequency of inspection and cleaning can best be determined from experience at each location.

WARNING: The collection of lint in the burner area and exhaust duct work can create a potential fire hazard.

8. For personal safety, the dryer **must be** electrically grounded in accordance with local codes and/or the National Electric Code ANSI/NFPA NO. 70-LATEST EDITION.

NOTE: Failure to do so will VOID THE WARRANTY.

9. **UNDER NO CIRCUMSTANCES** should the dryer door switches, lint drawer switch, heat safety circuit, or tilt switches ever be disabled.

WARNING: PERSONAL INJURY or FIRE COULD RESULT.

10. This dryer **is not** to be used in the presence of dry cleaning solvents or fumes.
11. Remove articles from the dryer as soon as the drying cycle has been completed.

WARNING: Articles left in the dryer after the drying and cooling cycles have been completed can create a fire hazard.

12. **DO NOT** operate steam dryers with more than 125 PSI steam pressure. Excessive steam pressure can damage steam coil and/or harm personnel.
13. Replace leaking flexible hoses or other steam fixtures immediately. **DO NOT** operate the dryer with leaking flexible hoses. **PERSONAL INJURY MAY RESULT.**
14. **READ and FOLLOW ALL CAUTION and DIRECTION LABELS ATTACHED TO THE DRYER.**

WARNING: YOU MUST DISCONNECT and LOCKOUT THE ELECTRIC SUPPLY and THE GAS SUPPLY or THE STEAM SUPPLY BEFORE ANY COVERS or GUARDS ARE REMOVED FROM THE MACHINE TO ALLOW ACCESS FOR CLEANING, ADJUSTING, INSTALLATION, or TESTING OF ANY EQUIPMENT per OSHA (Occupational Safety and Health Administration) STANDARDS.

AD-310

1 Auto Door / 2-Way Tilt with Heater Fault Indication

MACHINE OPERATION SUMMARY

The AD-310 incorporates one (1) emergency stop button located on the Right Front Control Door. This button is "TURN TO RELEASE," and **must be** in the released mode to power the machine. The Phase 5 microcomputer's display will light when the emergency stop button is released. To turn on the AD-310's control voltage, press the green "ON" button located on the Right Front Control Panel.

The AD-310 has two (2) electronic controllers:

- Phase 5 microcomputer...for material drying.
- Micro-1 PLC (Programmable Logic Controller) - for loading, unloading, and burner status monitoring.

The Phase 5 microcomputer responds to keypad commands only when the AD-310's tumbler section is level with **ALL** doors closed. The Micro-1 PLC (Programmable Logic Controller) controls loading and unloading only when the AD-310 is not drying material.

The "LOAD/UNLOAD" selector switch, located on the Right Front Control Door (refer to the **top illustration on page 5**) is provided for loading and unloading of the AD-310. This selector switch **will not** operate while the AD-310 is in a drying cycle.

The selector switch has three (3) positions:
"LOAD - DRY - UNLOAD."

This switch works in conjunction with the "TILT OFF/ON" selector, where the operator can select whether to "LOAD/UNLOAD" the dryer in the level or the tilted position.

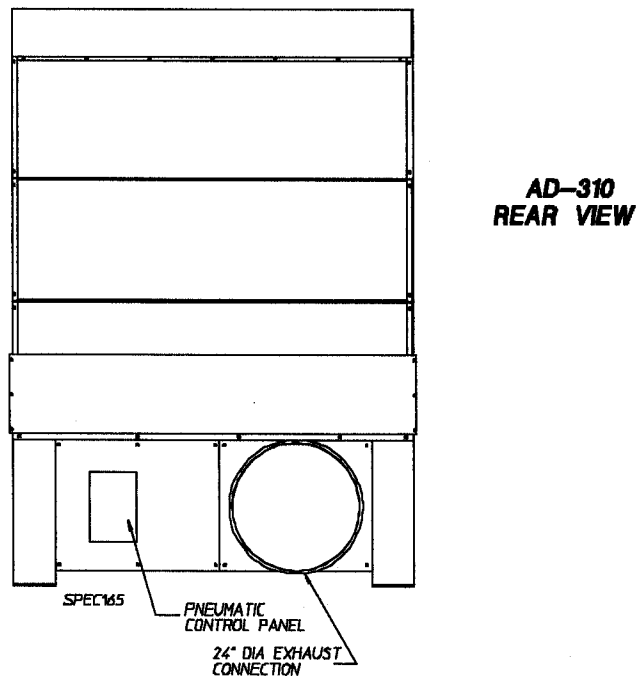
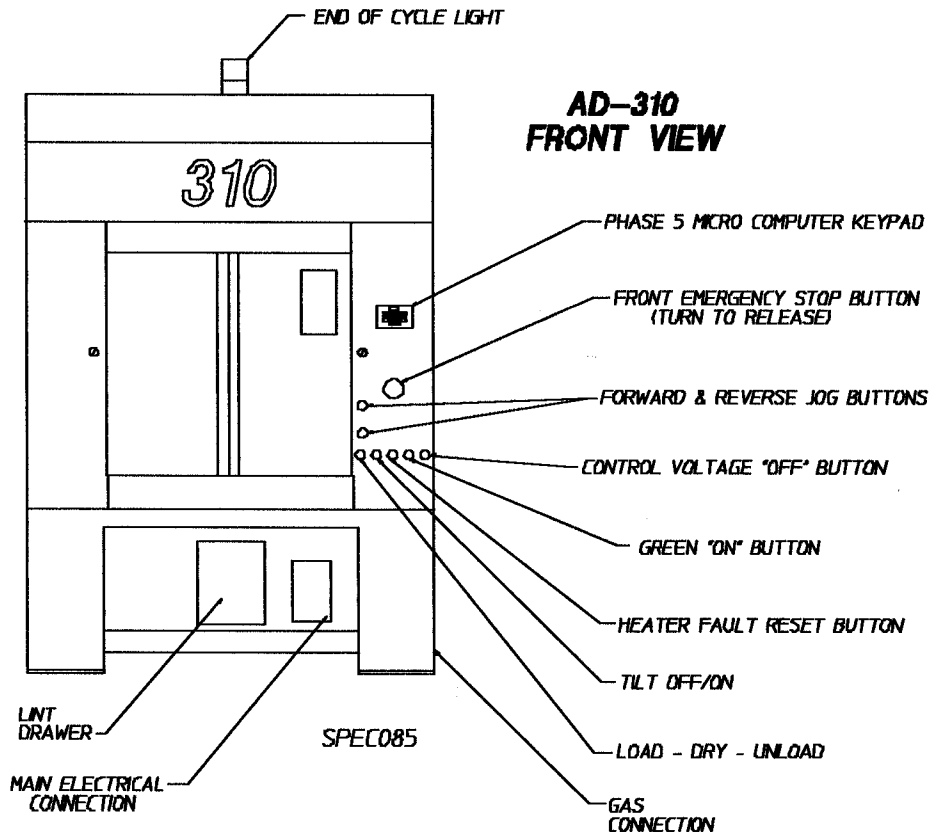
The "TILT OFF/ON" selector, located on the Right Front Control Door (refer to the **top illustration on page 5**) is for enabling or disabling the "LOAD/UNLOAD" tilt functions.

In the "OFF" position the doors will open, however the machine **will not tilt**. Likewise, on the "ON" position, loading and unloading will occur in their respective tilt positions (i.e., **LOAD - Front Up, UNLOAD - Rear Up**).

The AD-310 Tilt Auto Doors operate in the following manner:

- Doors **must be** open prior to tilting forwards or tilting backwards.

<p>IMPORTANT: The Lint Drawer must be closed prior to any tilting commands. Failure to close the Lint Drawer completely will prevent any tilting command.</p>



AD-310 DETAILED OPERATION INFORMATION

DRY ROUTINE

To dry material, the "**LOAD-DRY-UNLOAD**" selector switch **must be** in the Dry Position, the front auto doors closed, and the tumbler section level.

Once these conditions are satisfied, the Phase 5 microcomputer's keypad will respond to key-stroke inputs and drying cycles can be selected.

"LOAD TILTED"

The "**LOAD-TILT ON**" selection will cause the following to occur:

- The "**END OF CYCLE**" light will stop flashing.
- The Phase 5 keyboard will become inactive.
- The front doors will open
- The tumbler section will tilt to the rear (front up).
- Once the load doors are open the jog functions will be enabled. The jog function allows one to jog the tumbler forward or reverse, to load materials into the tumbler.

"UNLOAD TILTED"

The "**UNLOAD-TILT ON**" selection will cause the following to occur:

- The "**END OF CYCLE**" light will stop flashing.
- The Phase 5 keyboard will become inactive.
- The front doors will open
- The tumbler section will tilt to the front (rear up).
- Once the load doors are open the jog functions will be enabled. The jog function allows one to jog the tumbler forward or reverse, to load materials into the tumbler.

"LOAD LEVEL"

The "**LOAD-Tilt Off**" selection will cause the following to occur:

- The "**END OF CYCLE**" light will stop flashing.
- The Phase 5 keyboard will become inactive.
- The front doors will open
- The tumbler section will remain level.
- Once the load doors are open the jog functions will be enabled. The jog function allows one to jog the tumbler forward or reverse, to load materials into the tumbler.

"UNLOAD LEVEL"

The "**UNLOAD-Tilt Off**" selection will cause the following to occur:

- The "**END OF CYCLE**" light will stop flashing.
- The Phase 5 keyboard will become inactive.
- The front doors will open

- The tumbler section will remain level.
- Once the load doors are open the jog functions will be enabled. The jog function allows one to jog the tumbler forward or reverse, to load materials into the tumbler.

"DRY"

If the machine is in the level position, the "DRY" selection will:

- Close the front doors
- Enable the Phase 5 keyboard to respond to keypad inputs.

If the machine is in the tilted position, the "DRY" selection will:

- Close the front doors
- Disable the front jog buttons.
- Level the tumbler section.
- Enable the Phase 5 keyboard to respond to keypad inputs.

"HEATER FAULT" (Gas Models ONLY)

The ADG-310 has two (2) simultaneous controlled atmospheric burners.

Each burner has its own;

- Combustion Chamber with five (5) burner tubes each.
- A Spark Ignition Module.
- A Spark Ignitor/ Flame Probe Assembly.
- An Air Flow Status Switch (DPDT [double-pole-double-throw] for switch position information).
- A Gas Regulator Valve.

ADG-310 AIR FLOW SWITCH POSITION VERIFICATION

Air flow (Sail Switch) verification:

At the beginning of every drying cycle the position of both air switches are verified to be open. If not, the fan will never start and a "HEATER FAULT" will be displayed.

THE AIR FLOW SWITCHES *MUST BE OPEN BEFORE THE DRYING CYCLE STARTS,* and CLOSED AFTER THE FAN HAS STARTED.

If one or both Sail (air flow) Switches are closed at the beginning of a drying cycle the tumbler will turn, however, the fan will not start. Within 30 seconds the "DRYING CYCLE" will stop, the Phase 5 L.E.D. display will show "FILL", the Phase 5 keyboard *will not* accept any keypad entries, both the "END OF CYCLE" light and "HEATER FAULT RESET BUTTON" will begin to flash.

If the Sail Switch verification "TEST" is successful, the start of any "HEAT ON" signal by the Phase 5 computer will be monitored by the PLC (Programmable Logic Controller). The PLC

monitors the time between the "HEAT ON SIGNAL" and "GAS VALVE ON" signals. If the time between these two (2) signals is greater than fifteen (15) seconds, a "HEATER FAULT" will occur.

"HEATER FAULT"

"HEATER FAULT" is an indication that there is a problem with the heating portion of the dryer. The possible causes of "HEATER FAULT" are:

GAS

No Gas
Poor Gas Pressure

AIR FLOW

Insufficient Air Flow...i.e.,

- Make Up Air
- Clogged Lint Screen
- Too Much Back Pressure

AIR FLOW SWITCH (Sail Switch)

Sail Switch Not In The Correct Position:

- Closed During The Start Of A Drying Cycle
- Open After The Drying Cycle Has Begun
- Exhaust Hi-Limit Switch Open
- Front or Rear Burner Hi-Limit Switch Open

FLAME

Poor Spark
Only One (1) Burner Igniting Within The Correct Period Of Time
Faulty Flame Probe
Faulty DSI (Direct Spark Ignition) Module.

The following will occur for a "HEATER FAULT" after the first minute. The Phase 5 computer will display "FILL" and not be able to accept any keyboard entries, both the "END OF CYCLE LIGHT" and "HEATER FAULT RESET BUTTON" will flash. The fan and the tumbler will continue for two (2) minutes in a "NO HEAT" cool down. If during this "SAFETY" cool down the "HEATER FAULT RESET BUTTON" is pressed, the cool down will end. The fan and the tumbler will stop, and the flashing indicators will stop.

HEATER FAULT TEST ROUTINE

- At the start of any "HEAT ON" signal of the Phase 5 computer, the PLC (Programmable Logic Controller) monitors the time between the "HEAT ON" and "GAS VALVE ON" signals. If the time between these two (2) signals is greater than fifteen (15) seconds a "HEATER FAULT" will occur.
- After the initial 15 second time difference monitoring routine, the PLC will then continue to monitor the "HEAT ON"/"GAS VALVE STATUS" for any malfunction of either the front or

rear burners. If the heat signal is on and either or both gas valve *are not* engaged for more than three (3) seconds a "HEATER FAULT" will occur.

During a "HEATER FAULT" the following will occur:

- The "END OF CYCLE" light will begin to flash.
- The "HEATER FAULT RESET BUTTON" will begin to flash.
- The drying cycle will halt, the Phase 5 computer keypad *will not* respond to any keypad entries.
- Both "LOAD" and "UNLOAD" functions *will not* operate.
- The PLC will control the fan and tumbler causing the dryer to run a "COOL DOWN CYCLE" for two (2) minutes.
- The "HEATER FAULT RESET BUTTON" will respond during the "COOL DOWN CYCLE" where the machine will come to a stop.

NOTE: If the lint drawer is opened during a "HEATER FAULT COOL DOWN CYCLE" the following will occur:

- The two (2) minute "COOL DOWN CYCLE" will stop.
- The "HEATER FAULT" Indicators will not reset.

"HEATER FAULT" indicates that there is a problem with one or both burners not igniting properly.

"HEATER FAULT RESET"

IMPORTANT: During a "HEAT FAULT" the fan and tumbler run a "COOL DOWN CYCLE" for two (2) minutes, the "HEATER FAULT RESET BUTTON" will respond during the "COOL DOWN CYCLE."

- The "END OF CYCLE" and "HEATER FAULT" lights will stop flashing.
- The Phase 5 keyboard will respond to keystroke inputs, proving the machine is in the level position and doors are closed.
- The "LOAD" and "UNLOAD" functions will operate..

NOTE: If "HEATER FAULTS" continue to occur, troubleshooting of the heater section will be required. Refer to the ladder diagram and related wiring diagrams for heater signal information.

OPTIONAL "END OF CYCLE ALARM TONE"

The *OPTIONAL* "END OF CYCLE ALARM TONE" feature provides an audible signal that a drying cycle has ended, and that the material is ready for attention.

The *OPTIONAL* "END OF CYCLE ALARM TONE" is a slow pulse alarm that starts at the end of a drying cycle and remains on for 30 seconds (or less), unless a "LOAD" or "UNLOAD" selection is made.

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