

# **AD-78**

(Gas/Electric/Steam)

## **Installation 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 death.

Do not store or use gasoline or other flammable vapor 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.



For replacement parts, contact the distributor from which the dryer was purchased or

**American Dryer Corporation**

88 Currant Road

Fall River MA 02720-4781

Telephone: (508) 678-9010 / Fax: (508) 678-9447

E-mail: [service@amdry.com](mailto:service@amdry.com)

## **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-78** \_\_\_\_\_

DISTRIBUTORS 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) 678-9000. 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.

The illustrations on the following pages may not depict your particular dryer exactly. The illustrations are a composite of the various dryer models. Be sure to check the descriptions of the parts thoroughly before ordering.

#### **“IMPORTANT NOTE TO PURCHASER”**

Information must be obtained from your local gas supplier on the instructions to be followed if the user smells gas. These instructions must be posted in a prominent location near the dryer.

## **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 CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION.**

**VERIFY PROPER OPERATION AFTER SERVICING.**

## **CAUTION**

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

## **WARNING**

**CHILDREN SHOULD NOT BE ALLOWED TO PLAY ON OR NEAR THE DRYER(S).**

**CHILDREN SHOULD BE SUPERVISED IF NEAR DRYER(S) IN OPERATION.**

## **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.**

## **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.

The wiring diagram for the dryer is located in the front electrical control box area.

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# SECTION I

## IMPORTANT INFORMATION

### A. RECEIVING and HANDLING

The dryer is shipped in a protective stretch wrap cover with protective cardboard corners and top cover (or optional box) as a means of preventing damage in transit. Upon delivery, the dryer and/or packaging, and wooden skid should be visually inspected for shipping damage. If any damage whatsoever is noticed, inspect further before delivering carrier leaves.

Dryers damaged in shipment:

1. **ALL** dryers **should be** inspected upon receipt and before they are signed for.
2. If there is suspected damage or actual damage, the trucker's receipt **should be** so noted.
3. If the dryer is damaged beyond repair, it **should be** refused. Those dryers which were not damaged in a damaged shipment **should be** accepted, but the number received and the number refused **must be** noted on the receipt.
4. If you determine that the dryer was damaged after the trucker has left your location, you should call the delivering carrier's freight terminal immediately and file a claim. The freight company considers this concealed damage. This type of freight claim is very difficult to get paid and becomes extremely difficult when more than a day or two passes after the freight was delivered. It is your responsibility to file freight claims. Dryer/parts damaged in transit **cannot** be claimed under warranty.
5. Freight claims are the responsibility of the consignee, and **ALL** claims **must be** filed at the receiving end. **ADC** assumes no responsibility for freight claims or damages.
6. If you need assistance in handling the situation, please contact the **ADC** Traffic Manager at (508) 678-9000.

**IMPORTANT:** The dryer **must be** transported and handled in an upright position at all times.

## B. 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 back guards, outer tops, or service panels 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, or wax. **EXPLOSION COULD RESULT.**

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

**WARNING:** **DO NOT** use heat for drying articles that contain plastic, foam, sponge rubber, or similarly textured rubberlike 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 area around the back of 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, or heat safety circuit, 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 complete can create a fire hazard.

12. **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.**

# SECTION II

## SPECIFICATIONS/COMPONENT IDENTIFICATION

### A. SPECIFICATIONS

BASKET (TUMBLER) DIAMETER		44-1/2"	113 cm	
BASKET (TUMBLER) DEPTH		24-7/8"	63.2 cm	
BASKET (TUMBLER) MOTOR		1 HP*	.746 kw	
DOOR OPENING (DIAMETER)		31-3/8"	79.7 cm	
BASKET (TUMBLER) VOLUME		22.4 cu. ft.	.634 cu.m.	
DRYERS PER 20'/40" CONTAINER		10/20		
DRYERS PER 45'/48' TRUCK		24/24		
Gas	VOLTAGE AVAILABLE		120 / 208 / 240 / 480v / 1, 3 $\phi$ / 50/60Hz	
	APPROX. WEIGHT (UNCRATED)		895 lbs. 407 kg	
	APPROX. WEIGHT (CRATED)		950 lbs. 432 kg	
	HEAT INPUT		204,000 btu/hr 51,408 kcal/hr	
	AIRFLOW		1,200 cfm 33.98 cmm	
	Inlet Pipe Size		3/4"*** 1.91 cm	
Electric	VOLTAGE AVAILABLE		120 / 208 / 240 / 480v / 1, 3 $\phi$ / 50/60Hz	
	APPROX. WEIGHT (UNCRATED)		895 lbs. 407 kg	
	APPROX. WEIGHT (CRATED)		950 lbs. 432 kg	
	AIRFLOW		1,200 cfm 33.98 cmm	
Steam	VOLTAGE AVAILABLE		120 / 208 / 240 / 480v / 1, 3 $\phi$ / 50/60Hz	
	APPROX. WEIGHT (UNCRATED)		980 lbs 445 kg	
	APPROX. WEIGHT (CRATED)		1,130 lbs. 514 kg	
	AIRFLOW		1,200 cfm 33.98 cmm	
	COMPRESSED AIR VOLUME		.75 cfh .02 cmh	
	COMPRESSED AIR CONNECTION		1/8" F.P.T. .318 cm	
	STEAM COMSUMPTION		BOILER HP NORMAL LOAD	
	238.7 lbs/hr	108.3 kg/hr	7	
	OPERATING STEAM PRESSURE		STEAM SUPPLY	STEAM RETURN
	125 psi max	8.6 bar	1" 2.54 cm	1" 2.54 cm

*Shaded areas are stated in metric equivalents.*

\* For non-reversing models.

\*\* A minimum of 3/4" pipe **must be** supplied to the gas inlet for each dryer.

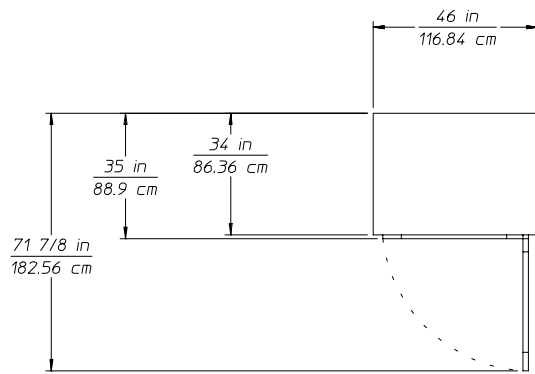
**IMPORTANT:** Steam dryers *must be* provided with a clean, dry, regulated 80 PSI (+/- 10 PSI) air supply.

**NOTE:** ADC reserves the right to make changes in specifications at any time, without notice or obligation.

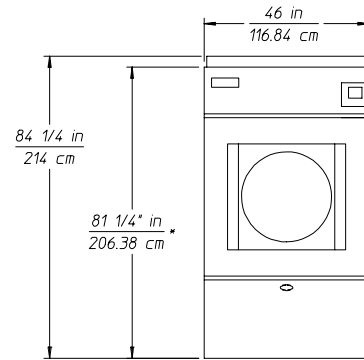
# Specifications\*

## ADG-78 (Gas)

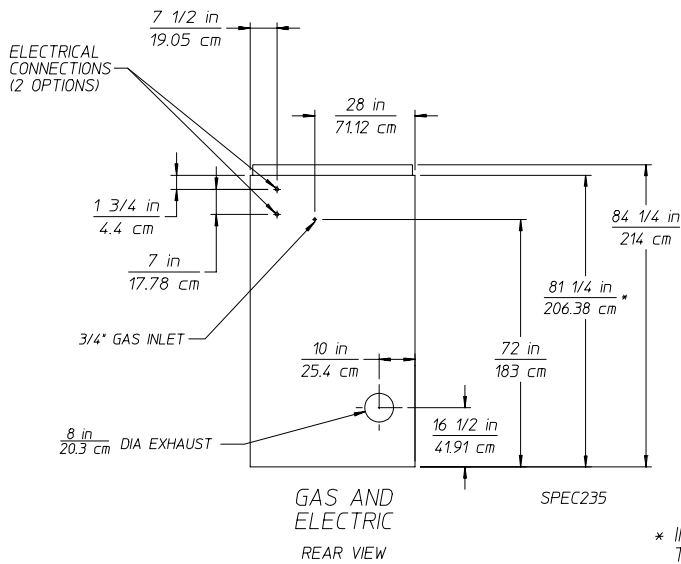
## ADE-78 (Electric)



PLAN VIEW



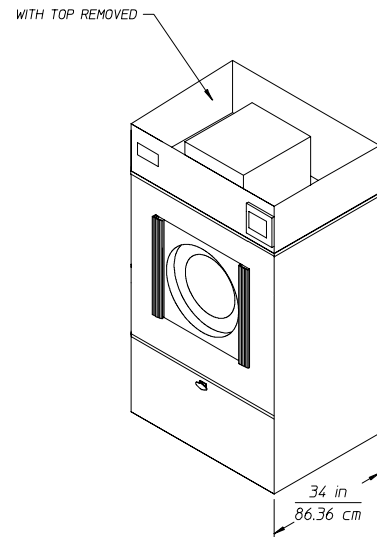
FRONT VIEW



GAS AND  
ELECTRIC  
REAR VIEW

SPEC235

\* INSTALLATION HEIGHT  
TOP 3" IS REMOVABLE

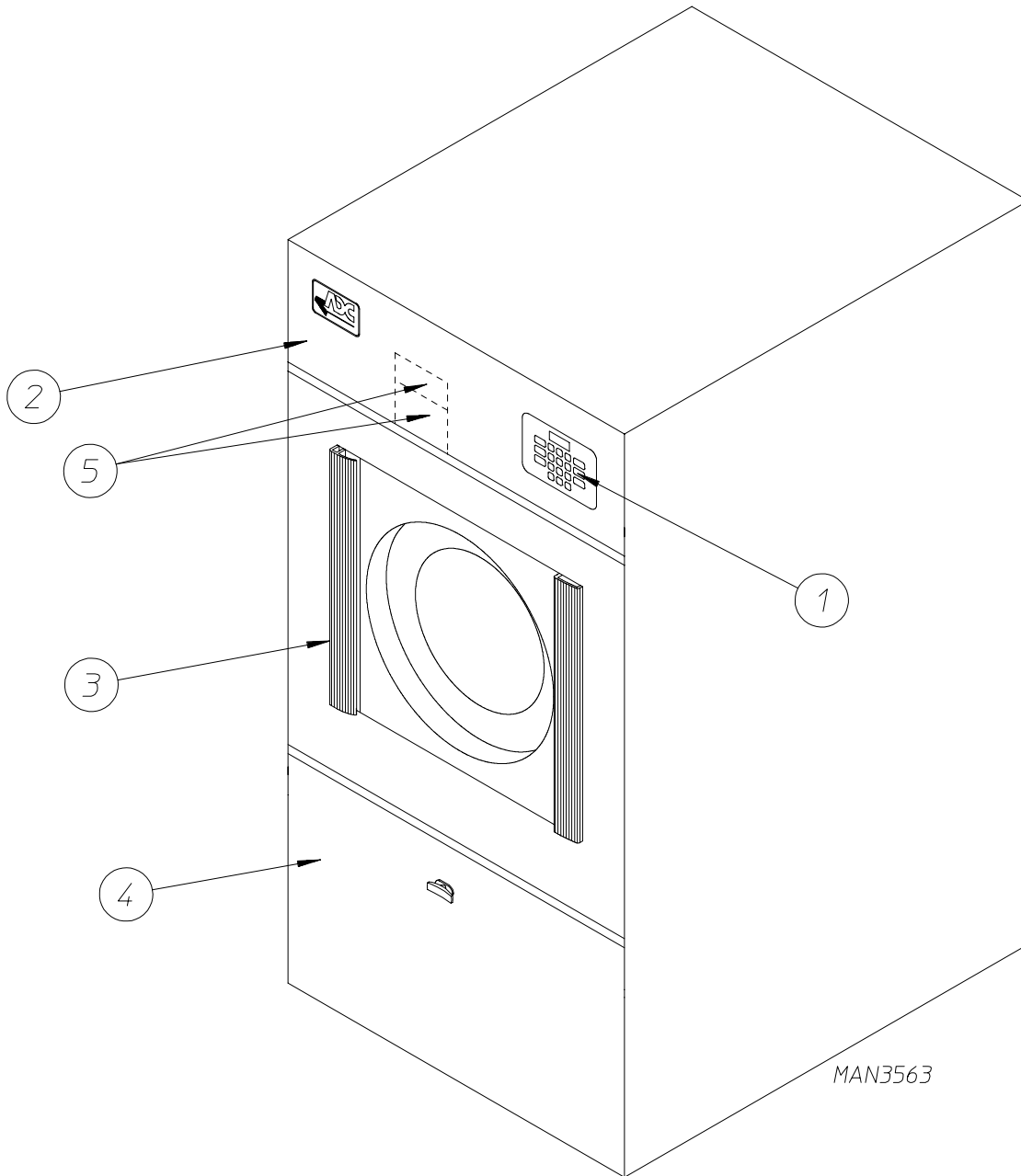


\* Specifications for the ADS-78 (steam model) were not available at time of printing...for information contact the factory.

**NOTE:** ADC reserves the right to make changes in specifications at any time, without notice or obligation.

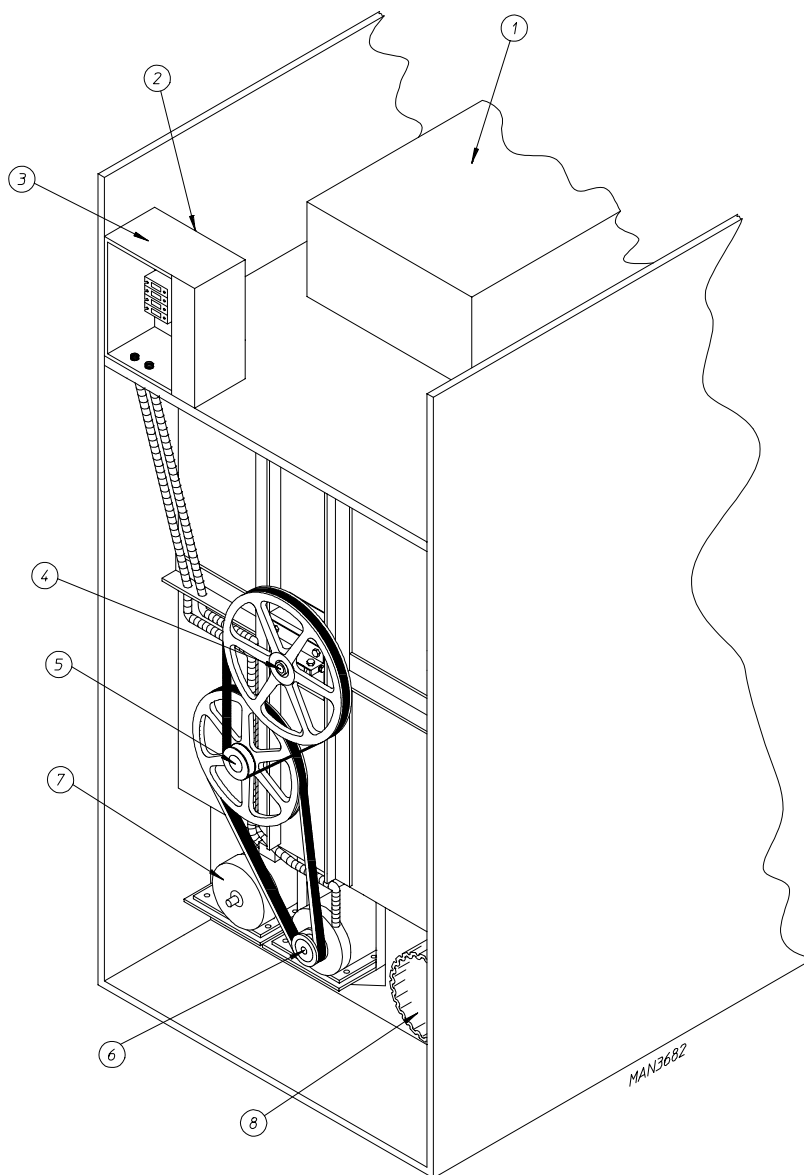
## B. COMPONENT IDENTIFICATION

### 1. Dryer Front View



<u>Illus. No.</u>	<u>Description</u>
1	Controls
2	Control (top access) Door Assembly
3	Main Door Assembly
4	Lint Compartment Area (lint screen located behind door)
5	Data Label and Installation Label (located behind control [service] door)

## 2. Dryer Rear View



<u>Illus. No.</u>	<u>Description</u>
1	Heating Unit
2	1/8" Compressed Air Supply Inlet (behind Electric Service Relay Box for Steam Models ONLY)
3*	Electric Service Relay Box
4	Tumbler Bearing Mount Assembly
5	Idler Bearing Mount Assembly
6	Basket (Drive) Motor Assembly (for Reversing Models ONLY)
7	Blower Motor Assembly
8	Dryer Exhaust

\* Electric service connections for Gas Models and Steam Models are made in this box.

# SECTION III

## INSTALLATION PROCEDURES

Installation **should be** performed by competent technicians in accordance with local and state codes. In the absence of these codes, the installation **must conform** to applicable American National Standards: National Fuel Gas Code ANSI.Z223.1-LATEST EDITION and/or National Electric Code ANSI/NFPA NO. 70-LATEST EDITION.

### A. LOCATION REQUIREMENTS

Before installing the dryer, be sure the location conforms to local codes and ordinances. In the absence of such codes or ordinances the location **must conform** with the National Fuel Gas Code ANSI.Z223.1-LATEST EDITION.

1. The dryer **must be** installed on a sound level floor capable of supporting its weight. It is recommended that carpeting be removed from the floor area that the dryer is to rest on.
2. The dryer **must not be** installed or stored in an area where it will be exposed to water and/or weather.
3. The dryer is for use in noncombustible locations.
4. Provisions for adequate air supply **must be** provided as noted in this manual (refer to **Fresh Air Supply** in **Section D**).
5. Clearance provisions **must be** made from combustible construction as noted in this manual (refer to **Dryer Enclosure Requirements** in **Section C**).
6. Provisions **must be** made for adequate clearances for servicing and for operation as noted in this manual (refer to **Dryer Enclosure Requirements** in **Section C**).
7. Dryer **must be** exhausted to the outdoors (refer to **Exhaust Requirements** in **Section E**).
8. Dryer **must be** located in an area where correct exhaust venting can be achieved as noted in the manual (refer to **Exhaust Requirements** in **Section E**).

**IMPORTANT:** Dryer *should be* located where a minimum amount of exhaust duct will be necessary.

## B. UNPACKING/SETTING UP

Remove protective shipping material (i.e., plastic wrap, and/or optional shipping box) from dryer.

**IMPORTANT:** Dryer *must be* transported and handled in an upright position at **ALL** times.

The dryer can be moved to its final location while still attached to the skid or with the skid removed. To un-skid the dryer, locate and remove the four (4) bolts securing the base of the dryer to the wooden skid. Two (2) are at the rear base (remove the back panel for access), and two (2) are located in the bottom of the lint chamber. To remove the two (2) bolts located in the lint chamber area, remove the lint door.

To increase bearing life and improve efficiency, the dryer **should be** tilted slightly to the rear.

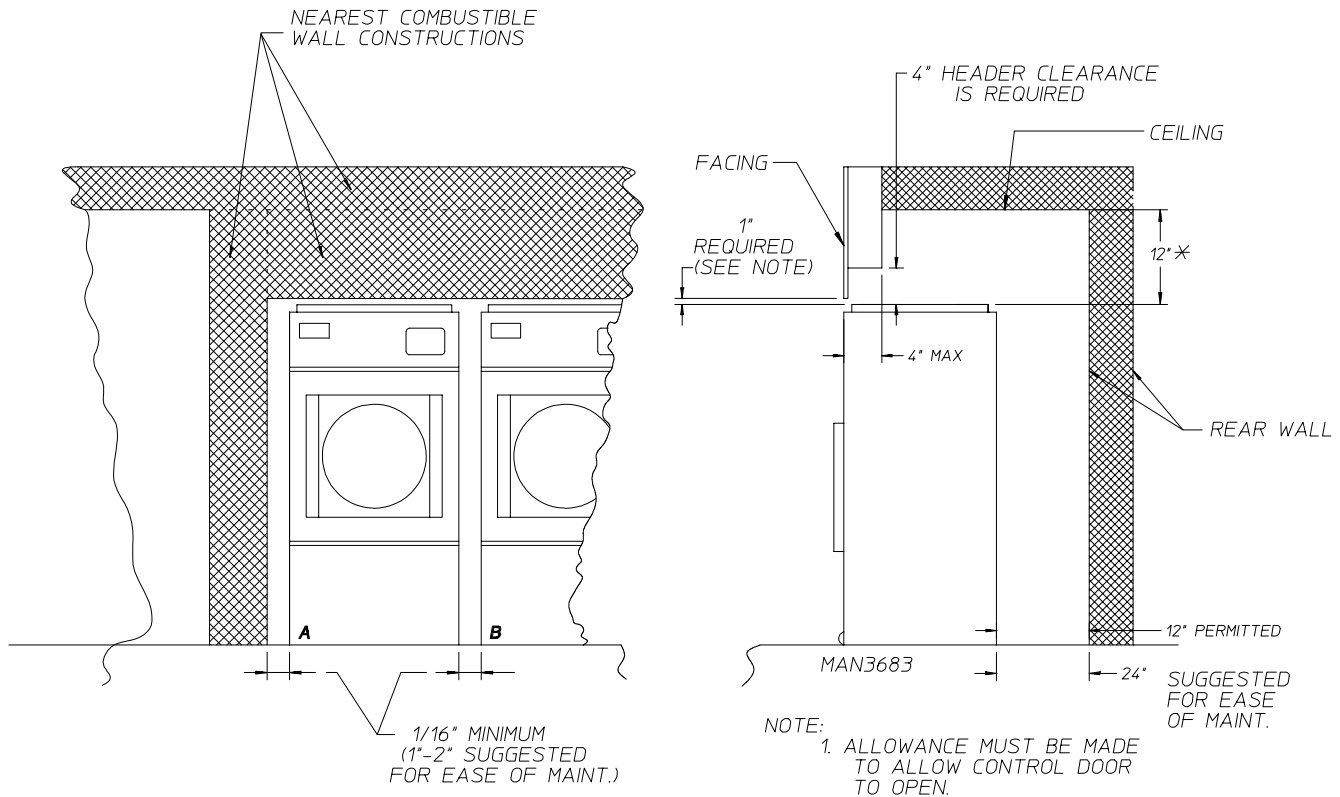
The basket (tumbler) is supported during shipping by a wooden block. **REMOVE THIS BLOCK BEFORE STARTING THE DRYER.**

**IMPORTANT:** For microprocessor (computer) models, this wooden block *must be* removed before connecting power to the dryer or irreparable damage to the basket (tumbler) will result.

The lint coops of **ALL** AD-78 dryers are supported during shipping by a bracket. **REMOVE THIS BRACKET BEFORE STARTING THE DRYER.**

## C. DRYER ENCLOSURE REQUIREMENTS

Bulkheads and partitions **should be** made of noncombustible materials and **must be** located a minimum of twelve (12) inches (18-inches or more is recommended for ease of installation, maintenance, and service) above the dryer outer top, except along the front of the dryer which may be partially closed in if desired. The clearance between the bulkhead header and the dryer **must be** a minimum of four (4) inches and **must not** extend more than four (4) inches to the rear of the front. The bulkhead facing **must not** be closed in all the way to the top of the dryer. A one (1) inch clearance is required.



\*IN CASES WHERE SPRINKLER HEADS ARE OVER THE DRYERS 18" IS SUGGESTED.

INSTALLATION: DRYER CLEARANCE TO ADJACENT WALL STRUCTURES.

**NOTE:** Allowances **must be** made for opening the control door.

Dryers may be positioned side wall to side wall. However, a 1/16" minimum allowance **must be** made for opening and closing of the control door and the lint door. It is suggested that the dryer be positioned about two (2) feet away from the nearest obstruction for ease of installation, maintenance, and service (to be measured from the back guard. (Refer to the **illustration above** for details.)

**NOTE:** Air considerations are important for proper and efficient operation.



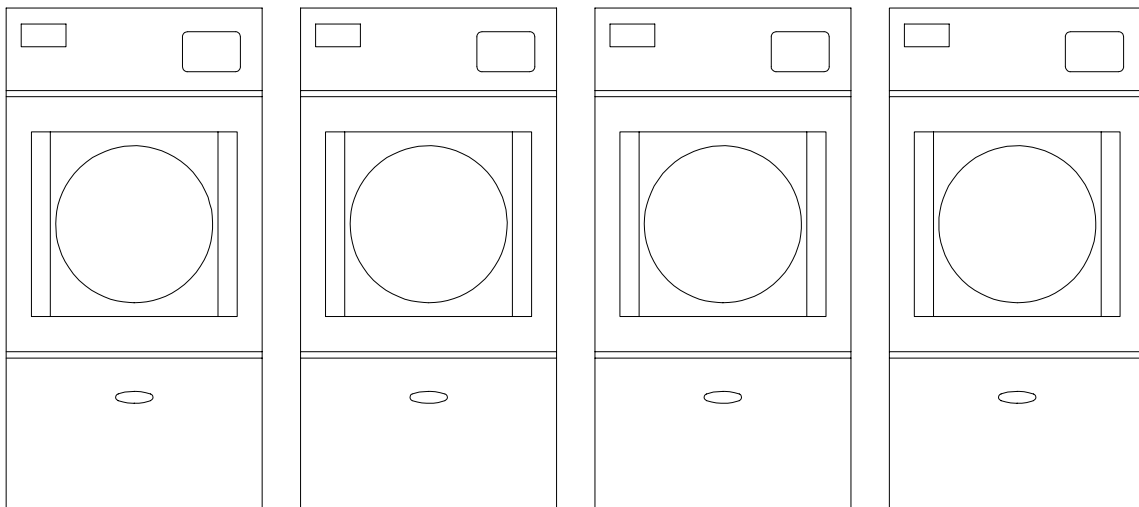
**IMPORTANT:** Even though a minimum of only 12-inches is required, 18-inches or more is suggested. The additional clearance is advantageous for ease of installation and service.

**IMPORTANT:** When fire sprinkler systems are located above the dryers, a minimum of 18-inches above the dryer console (module) is required. Dryers may be positioned side wall to side wall however, a 1/16" minimum allowance is required between dryers (or wall) for ease of installation and maintenance. Allowances **must be** made for the opening and closings of the control door and the lint door.

## D. FRESH AIR SUPPLY

When the dryer is operating, it draws in room air, heats it, passes this air through the basket (tumbler), and exhausts it out of the building. Therefore, the room air **must be** continually replenished from the outdoors. If the make-up air is inadequate, drying time and drying efficiency will be adversely affected. Ignition problems and sail switch "fluttering" problems may result, as well as premature motor failure from overheating.

Air supply (make-up air) **must be** given careful consideration to assure proper performance of each dryer. An unrestricted source of air is necessary for each dryer. An air flow of 1,200 cfm (cubic feet per minute) **must be** supplied to each gas and electric dryer and 1,350 cfm (cubic feet per minute) **must be** supplied to each steam dryer. As a general rule, an unrestricted air entrance from the outdoors (atmosphere) of a minimum of 1-1/2 square feet is required for each dryer.



TYPICAL INSTALLATION SHOWING MAKE-UP AIR OPENINGS

MAN3565

To compensate for the use of registers or louvers used over the openings, this make-up air **must be** increased by approximately thirty-three percent (33%). Make-up air openings **should not be** located in an area directly near where exhaust vents exit the building.

It is not necessary to have a separate make-up air opening for each dryer. Common make-up air openings are acceptable. However, they **must be** set up in such a manner that the make-up air is distributed equally to **ALL** the dryers.

EXAMPLE: For a bank of four (4) dryers, two (2) unrestricted openings measuring 2 feet by 1-1/2 feet (6 square feet) is acceptable.

Allowances **must be** made for remote or constricting passageways or where dryers are located at excessive altitudes or predominantly low pressure areas.

**IMPORTANT:** Make-up air *must be* provided from a source free of dry cleaning solvents fumes. Make-up air that is contaminated by dry cleaning solvent fumes will result in irreparable damage the motors and other dryer components.

**NOTE:** Component failure due to dry cleaning solvent fumes will VOID THE WARRANTY.

## E. EXHAUST REQUIREMENTS

### 1. General Exhaust Duct Work Information

Exhaust duct work **should be** designed and installed by a qualified professional. Improperly sized duct work will create excessive back pressure which results in slow drying, increased use of energy, overheating of the dryer, and shutdown of the burner by the airflow (sail) switches, burner hi-limits, or basket (tumbler) hi-heat thermostats.

**CAUTION: DRYER *MUST BE* EXHAUSTED TO THE OUTDOORS.**

**CAUTION: IMPROPERLY SIZED OR INSTALLED EXHAUST DUCT WORK CAN CREATE A POTENTIAL FIRE HAZARD.**

The duct work **should be** laid out in such a way that the duct work travels as directly as possible to the outdoors with as few turns as possible. Single or independent dryer venting is recommended.

#### Horizontal Venting:

When single drying venting is used the length of duct work from the dryer to the outside exhaust outlet **should not** exceed fifteen (15) feet. The minimum diameter of this duct work **must be** at least 10-inches (even though the dryer exhaust duct for gas and electric dryers is only 8-inches). In the case of multiple (common) dryer venting, the distance from the last dryer to the outside exhaust outlet **should not** exceed (15) feet. The shape of the duct work is not critical so long as the minimum cross-sectional area is provided. It is suggested that the use of 90° turns be avoided; use 30° and/or 45° angles instead. The radius of the elbows **should preferably be** 1-1/2 times the diameter of the duct. Including basket (tumbler)/dryer elbow connections or elbows used for outside protection from the weather, no more than two (2) elbows **should be** used in the exhaust duct run. If more than two (2) elbows are used, the cross sectional area of the duct work **must be** increased. **ALL** duct work **should be** smooth inside with no projections from sheet metal screws or other obstructions which will collect lint. When adding ducts, the duct to be added should overlap the duct to which it is to be connected. **ALL** duct work joints **must be** taped to prevent moisture and lint from escaping into the building. Inspection door **should be** installed at strategic points in the exhaust duct work for periodic inspection and clean-out of lint from the duct work.

#### Vertical Venting:

When single dryer venting is used the length of the duct work from the dryer to the outside exhaust outlet **should not** exceed twenty (20) feet. The minimum diameter of this duct work **must be** at least 12- inches (even though the dryer exhaust duct for gas and electric units is only 8-inches). In the case of multiple (common) dryer venting, the distance from the last dryer to the outside exhaust outlet **should not** exceed twenty (20) feet. The shape of the duct work is not so critical so long as the minimum cross sectional area is provided. It is suggested that the use of 90° turns be avoided; use 30° and/or 45° bends instead. The radius of the elbows **should preferably be** 1-1/2 times the diameter of the duct. **ALL** duct work **should be** smooth inside with no projections from sheet metal screws or other obstructions which will collect lint. When adding ducts, the duct to be added should overlap the duct to which it is to be connected. **ALL** duct work joints **must be** taped to prevent moisture and lint from escaping into the building. Inspection door **should be** installed at strategic points in the exhaust duct work for periodic inspection and clean-out of lint from the duct work.

**IMPORTANT: Exhaust back pressure measured by a manometer in the exhaust duct *should not* exceed 0.3 inches of water column.**

**IMPORTANT:** Minimum duct work diameter for horizontal venting is 10-inches and for vertical venting the minimum is 12-inches.

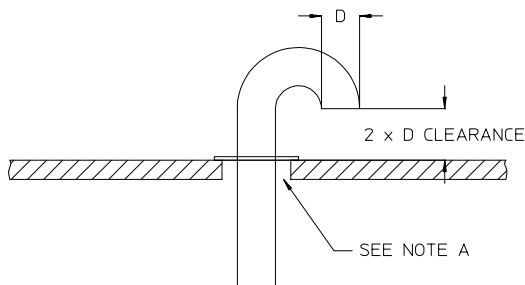
**NOTE:** Where the exhaust duct work passes through a wall, ceiling, or roof made of combustible materials, the opening *must be* 2-inches larger (all the way around) than the duct. The duct *must be* centered within this opening.

a. Outside Duct Work Protection

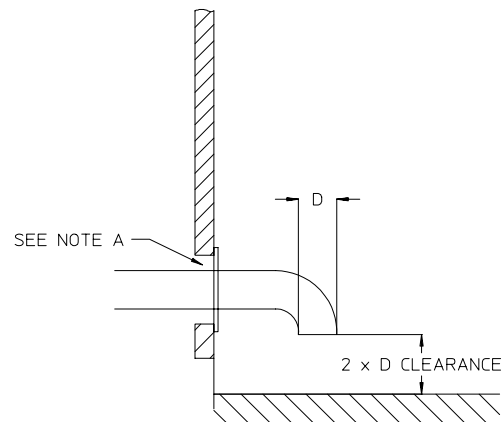
- 1) To protect the outside end of horizontal duct work from the weather, a 90° elbow bent downward **should be** installed where the exhaust exits the building. If the duct work travels vertically up through the roof, it **should be** protected from the weather by using a 180° turn to point the opening downward. In either case, allow at least twice the diameter of the duct between the duct opening and the nearest obstruction.

**IMPORTANT:** *DO NOT* use screens or caps on the outside of opening of exhaust duct work.

VERTICAL DUCTING



HORIZONTAL DUCTING



NOTE \*A\*: OPENING MUST BE TWO (2) INCHES LARGER THAN DUCT (ALL THE WAY AROUND). THE DUCT MUST BE CENTERED WITHIN THIS OPENING

MAN0731

2. Single Dryer Venting

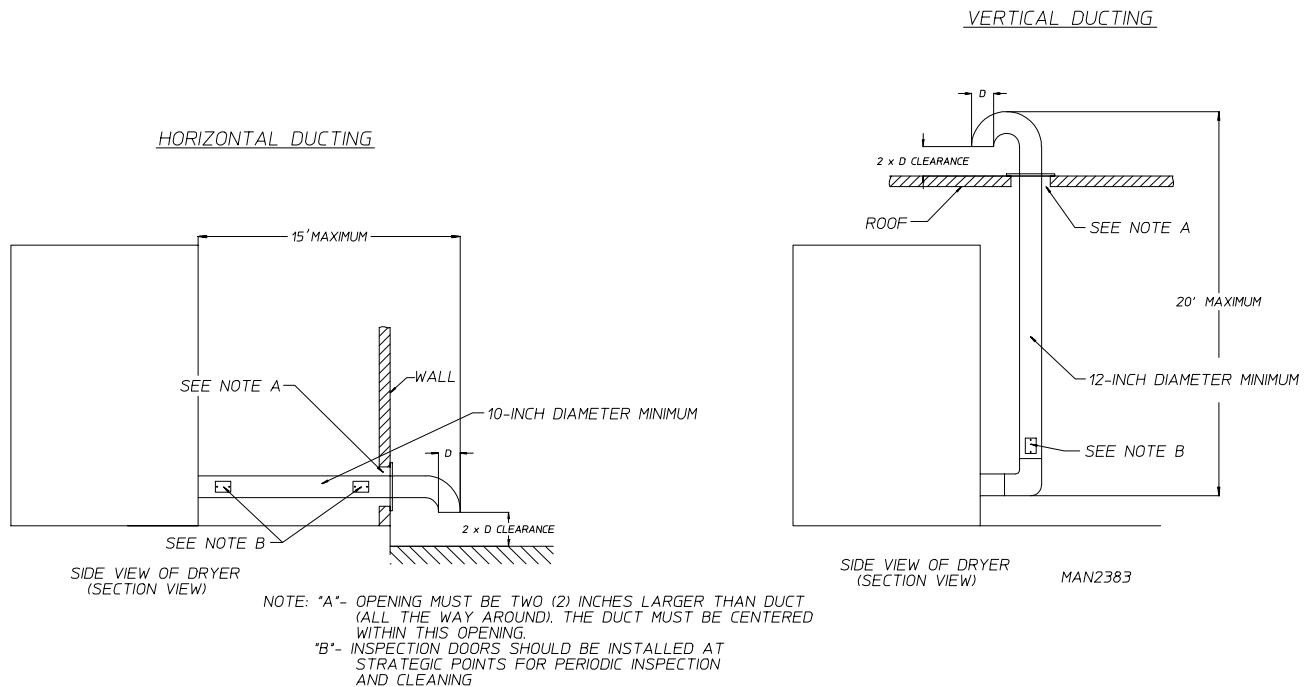
Where possible, it is suggested to provide a separate exhaust duct for each dryer. The exhaust duct **should be** laid out in such a way that the duct work travels as directly as possible to the outdoors with as few turns as possible. It is suggested that the use of 90° turns in the ducting be avoided; use 30° and/or 45° angles instead. The shape of the exhaust duct work is not critical so long as the minimum cross section area is provided.

**IMPORTANT:** Minimum duct size for a dryer that is vented horizontally is 10-inches for a round duct or an equivalent of 80 square inches. ***THE DUCT SIZE MUST NOT BE REDUCED ANYWHERE DOWN STREAM OF THE DRYER.***

**IMPORTANT:** Exhaust back pressure measured by a manometer at each basket (tumbler) exhaust duct area **should not** exceed 0.3 inches of water column.

**IMPORTANT:** Minimum duct size for a dryer that is vented vertically is 12-inches for a round duct or an equivalent of 120 square inches. ***THE DUCT SIZE MUST NOT BE REDUCED ANYWHERE DOWN STREAM OF THE DRYER.***

### SINGLE DRYER VENTING



**IMPORTANT:** For extended duct work runs, the cross section area of the duct work can only be increased to an extent. When the duct work approaches the maximum limits noted in this manual, a professional heating venting air conditioning (HVAC) firm ***should be*** consulted for proper venting information.

**ALL** duct work ***should be*** smooth inside with no projections from sheet metal screws or other obstructions which will collect lint. When adding ducts, the duct to be added should overlap the duct to which it is to be connected. **ALL** duct work joints ***must be*** taped to prevent moisture and lint from escaping into the building. Inspection doors ***should be*** installed at strategic points in the exhaust duct work for periodic inspection and clean-out of lint from the duct work.

**NOTE:** Where the exhaust duct passes through a wall, ceiling, or roof made of combustible materials, the opening ***must be*** 2-inches larger (all the way around) than the duct. The duct ***must be*** centered within this opening.

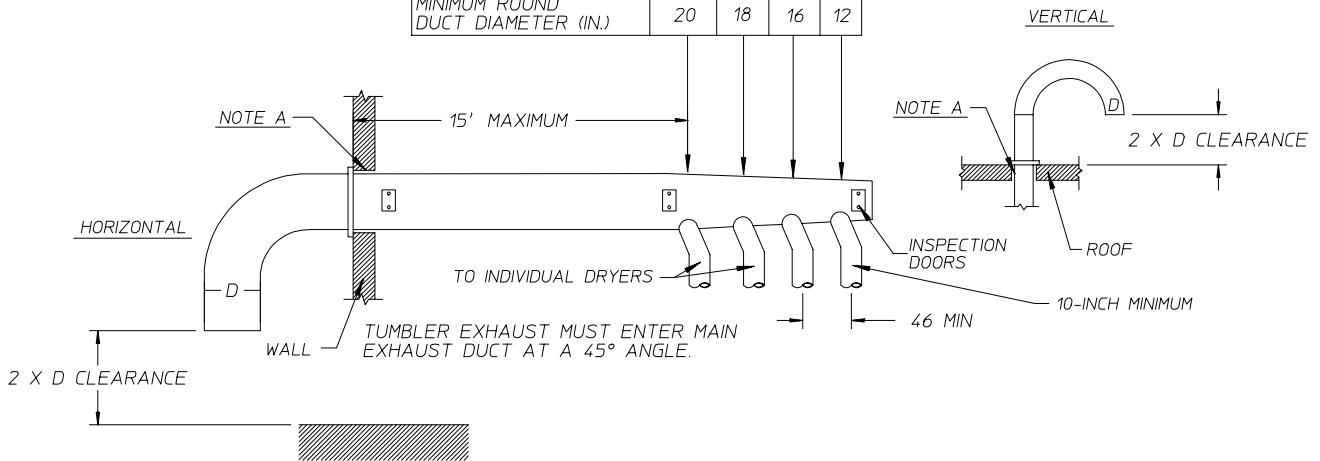
#### a. Outside Duct Work Protection

- 1) To protect the outside end of horizontal duct work from the weather, a 90° elbow bent downward ***should be*** installed where the exhaust exits the building. If the duct work travels vertically up through the roof, it ***should be*** protected from the weather by using a 180° turn to point the opening downward. In either case, allow at least twice the diameter of the duct between the duct opening and the nearest obstruction.

**IMPORTANT:** ***DO NOT*** use screens or caps on the outside of opening of exhaust duct work.

MULTIPLE DRYER VENTING (ADG-78/ADE-78) WITH 10" DIAMETER  
(1200 CFM) EXHAUST CONNECTIONS AT COMMON DUCT

NO. OF DRYERS	4	3	2	1
MINIMUM CROSS SECTION AREA (SQ.IN.)	315	254	200	113
MINIMUM ROUND DUCT DIAMETER (IN.)	20	18	16	12

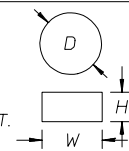


IMPORTANT: NO MORE THAN 4 DRYERS CAN BE CONNECTED TO ONE COMMON DUCT ( VENT ).

FORMULAS TO CALCULATE DUCTING CROSS SECTIONAL AREA

CROSS SECTIONAL AREA OF A ROUND DUCT =  $.785 \times D^2$  WHERE D = DIAMETER OF THE DUCT.

CROSS SECTIONAL AREA OF A RECTANGULAR DUCT =  $w \times h$  WHERE W = WIDTH AND H = HEIGHT.



NOTE A: OPENING MUST BE TWO (2) INCHES LARGER THAN DUCT (ALL THE WAY AROUND). THE DUCT MUST BE CENTERED WITHIN THIS OPENING.

MAN3687

## F. ELECTRICAL INFORMATION

### 1. Electrical Requirements

It is your responsibility to have **ALL** electrical connections made by a properly licensed and competent electrician to assure that the electrical installation is adequate and conforms with local and state regulations or codes. In the absence of such codes, **ALL** electrical connections, material, and workmanship **must conform** to the applicable requirements of the National Electrical Code ANSI/NFPA NO.70-LATEST EDITION..

**IMPORTANT:** Failure to comply with these codes or ordinances, and/or the requirements stipulated in this manual can result in personal injury or component failure.

**NOTE:** Component failure due to improper installation will VOID THE WARRANTY.

Each dryer **should be** connected to an independently protected branch circuit. **THE DRYER *MUST BE* CONNECTED WITH COPPER WIRE ONLY. *DO NOT use aluminum wire which could cause a fire hazard.*** The copper conductor wire/cable **must be** of proper ampacity and insulation in accordance with electric codes for making **ALL** service connections.

**NOTE:** The use of aluminum wire will VOID THE WARRANTY.

**IMPORTANT:** A separate circuit servicing each dryer ***must be*** provided.

2. Electrical Service Specifications

<p align="center"><b>ADG-78 (Gas)</b> <b>ADS-78 (Steam)</b></p> <p align="center">ELECTRIC SERVICE SPECIFICATIONS (per dryer)</p>						
<p><b>IMPORTANT:</b> 208 VAC and 230/240 VAC <u>ARE NOT THE SAME</u>. When ordering, specify <i>exact voltage</i>.</p> <p><b>NOTE:</b> A. Fuse ratings are dual-element, time-delay, current limiting, class RK1 or RK5 <b>ONLY</b>.                      B. Circuit breakers are thermal magnetic (industrial) type <b>ONLY</b>. For others, calculate/verify correct breaker size according to appliance amp draw rating and type of breaker used.                      C. Circuit breakers for 3-phase dryers <b>must be</b> 3-pole type.</p>						
SERVICE VOLTAGE	PHASE	WIRE SERVICE	APPROX. AMP DRAW	MINIMUM WIRE SIZE*	FUSING	CIRCUIT BREAKER
					Dual Element Time Delay	
120	1ø	2	13	#10	20	25
208	1ø	2	8	#14	12	15
208	3ø	3	5	#14	8	15
230	1ø	2	7	#14	10	15
230	3ø	3	5	#14	8	15
240	1ø	2	7	#14	10	15
380-400	3ø	3	3	#14	5	15
416	3ø	3	3	#14	5	15
460	3ø	3	3	#14	5	15

**IMPORTANT:** The dryer *must be* connected to the electric supply shown on the data label that is affixed to the back of the dryer, at the upper right hand corner. In the case of 208 VAC or 230/240 VAC, the supply voltage *must match* the electric service specifications of the data label *exactly*.

**IMPORTANT:** The wire size *must be* properly sized to handle the related current.

**WARNING:** 208 VAC and 230/240 VAC ARE NOT THE SAME. Any damage done to dryer components due to improper voltage connections will automatically VOID THE WARRANTY.

**NOTE:** For electrically heated and steam models, contact the factory for electrical service specifications.

**NOTE:** ADC reserves the right to make changes in specifications at any time, without notice or obligation.



### 3. Grounding

A ground (earth) connection **must be** provided and installed in accordance with state and local codes. In the absence of these codes, grounding **must conform** to applicable requirements of the National Electric Code ANSI/NFPA NO. 70-LATEST EDITION. The ground connection may be to a proven earth ground at the location service panel.

For added personal safety, when possible, it is suggested that a separate ground wire (no. 18 minimum) be connected from the ground connection of the dryer to a grounded cold water pipe. **DO NOT** ground to a gas pipe or hot water pipe. The grounded cold water pipe must have metal to metal connection all the way to the electrical ground. If there are any non-metallic interruptions, such as, a meter, pump, plastic, rubber, or other insulating connectors, they **must be** jumped out with no. 4 copper wire and securely clamped to bare metal at both ends.

**IMPORTANT:** For personal safety and proper operation, the dryer *must be* grounded.

Provisions are made for ground connection in each dryer at the electrical service connection area.

### 4. Electrical Connections

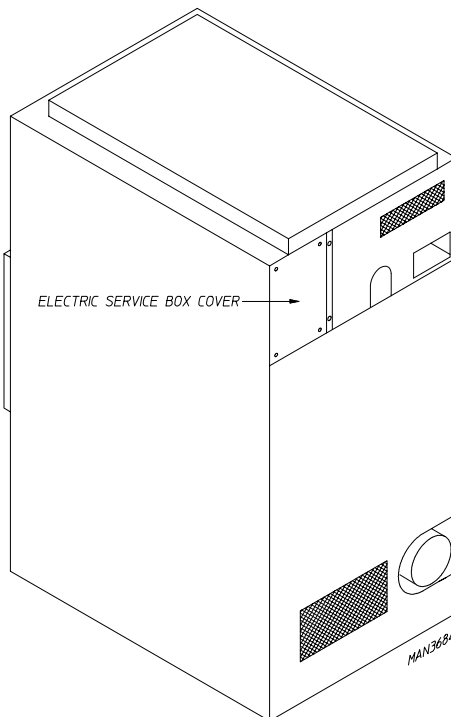
**NOTE:** A wire diagram is located in the front electrical control box for connection data.

a. GAS MODELS and STEAM MODELS ONLY

**NOTE: A CIRCUIT SERVING EACH DRYER *MUST BE* PROVIDED.**

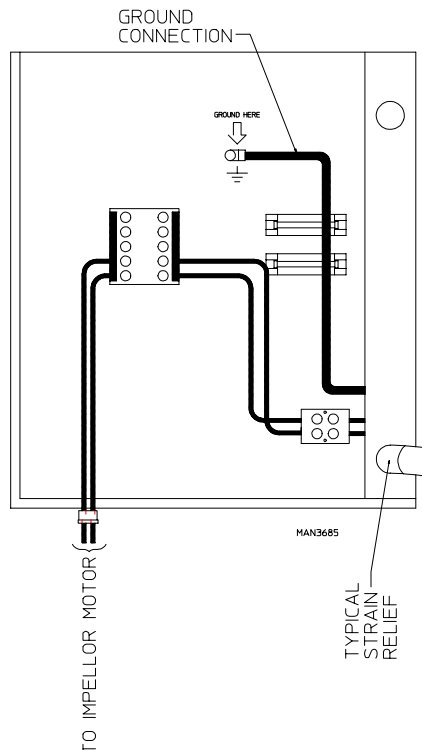
#### 1) Single-phase (1 $\phi$ ) Wiring Connections (Hookup)

The electrical connections on **ALL** single-phase (1 $\phi$ ) gas models and steam model dryers are made into the rearservice box located at the upper left area of the dryer.



Connect L1 and L2 to the power block and ground to the copper lug located in the rear service box mentioned above.

SINGLE-PHASE (1 $\phi$ ) ELECTRICAL CONNECTION LEADS		
BLACK + POSITIVE	WHITE + NEUTRAL	GREEN + GROUND
OR L2		



If local codes permit, power to the dryer can be made by the use of a flexible U.L. listed power cord/pigtail (wire size **must conform** to rating of dryer), or the dryer can be hard wired directly to the service breaker panel. In both cases, a strain relief **must be** installed where the wiring enters the dryer.

b. 3-Phase (3 $\phi$ ) Wiring Connections (Hookup) - for NON-REVERSING MODELS ONLY

The electrical connections on **ALL** 3-phase (3 $\phi$ ) gas model and steam model dryers are made into the rear service box located at the upper left area of the dryer. Electrical connections for electrically heated dryers are made in the electric oven area located at the upper rear area of the dryer.

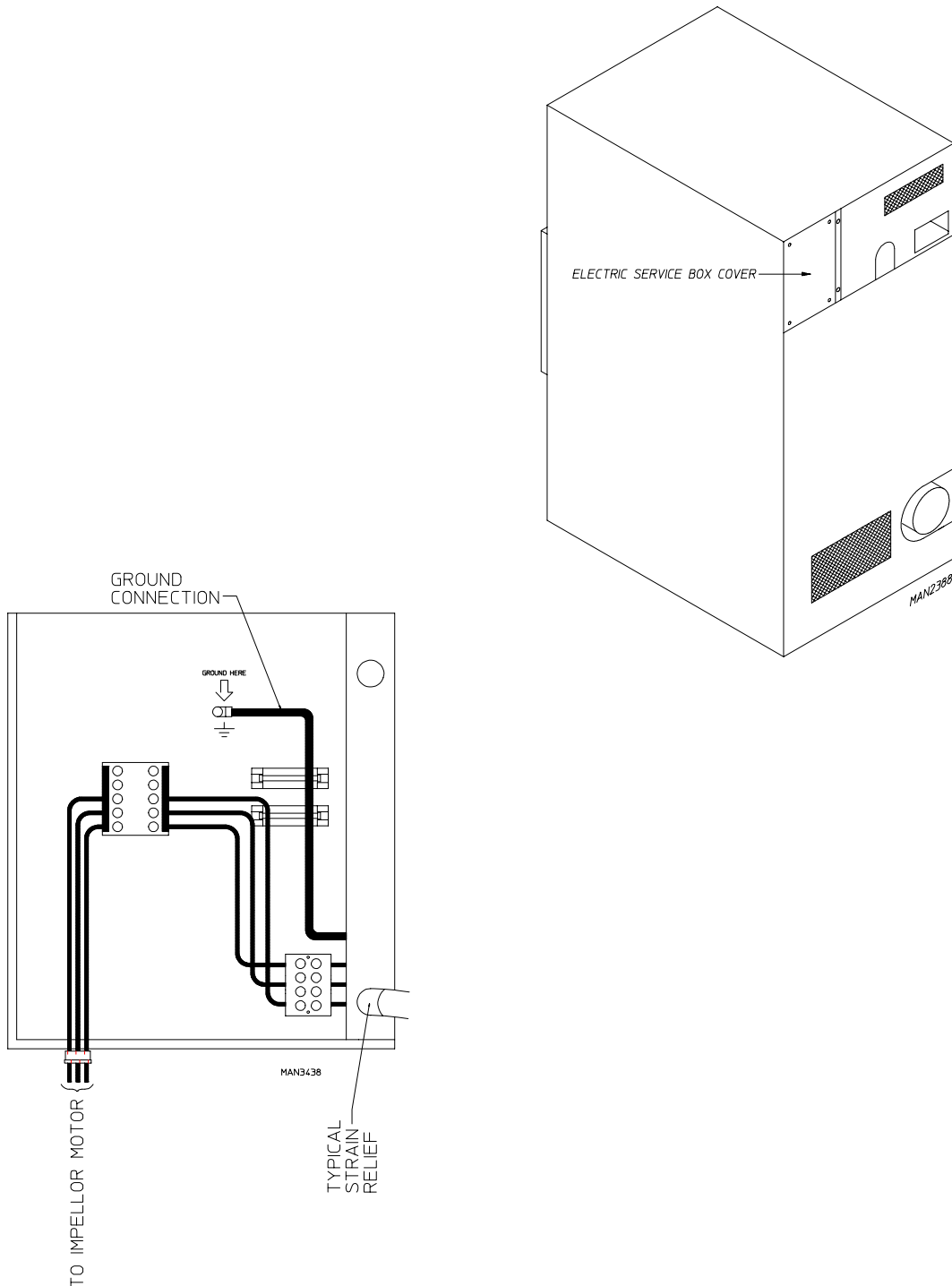
**NOTE: A CIRCUIT SERVING EACH DRYER *MUST BE* PROVIDED.**

If local codes permit, power to a gas or steam dryer can be made by the use of a flexible U.L. listed power cord/pigtail (wire size **must conform** to rating of dryer), or the dryer can be hard wired directly to the service breaker panel. In **ALL** cases, a strain relief **must be** installed where the wiring enters the dryer.

## 1) GAS MODELS and STEAM MODELS ONLY

The only electrical input connections to the dryer are the 3-phase (3 $\phi$ ) power leads (L1,L2,L3 and sometimes neutral) and ground. Single-phase (1  $\phi$ ) power for the control circuit is done internally to the dryer. No single-phase (1 $\phi$ ) input connection is required on a 3-phase (3 $\phi$ ) dryer.

For gas and steam dryers manufactured for operation at 3-phase (3 $\phi$ ), the electrical connections are made at the power distribution block located in the service box at the rear, upper left corner of the dryer. The ground connection is made to the copper lug also provided in this box. To gain access to the service box contactor, the service box cover **must be** removed.



## 1) ELECTRICALLY HEATED MODELS ONLY

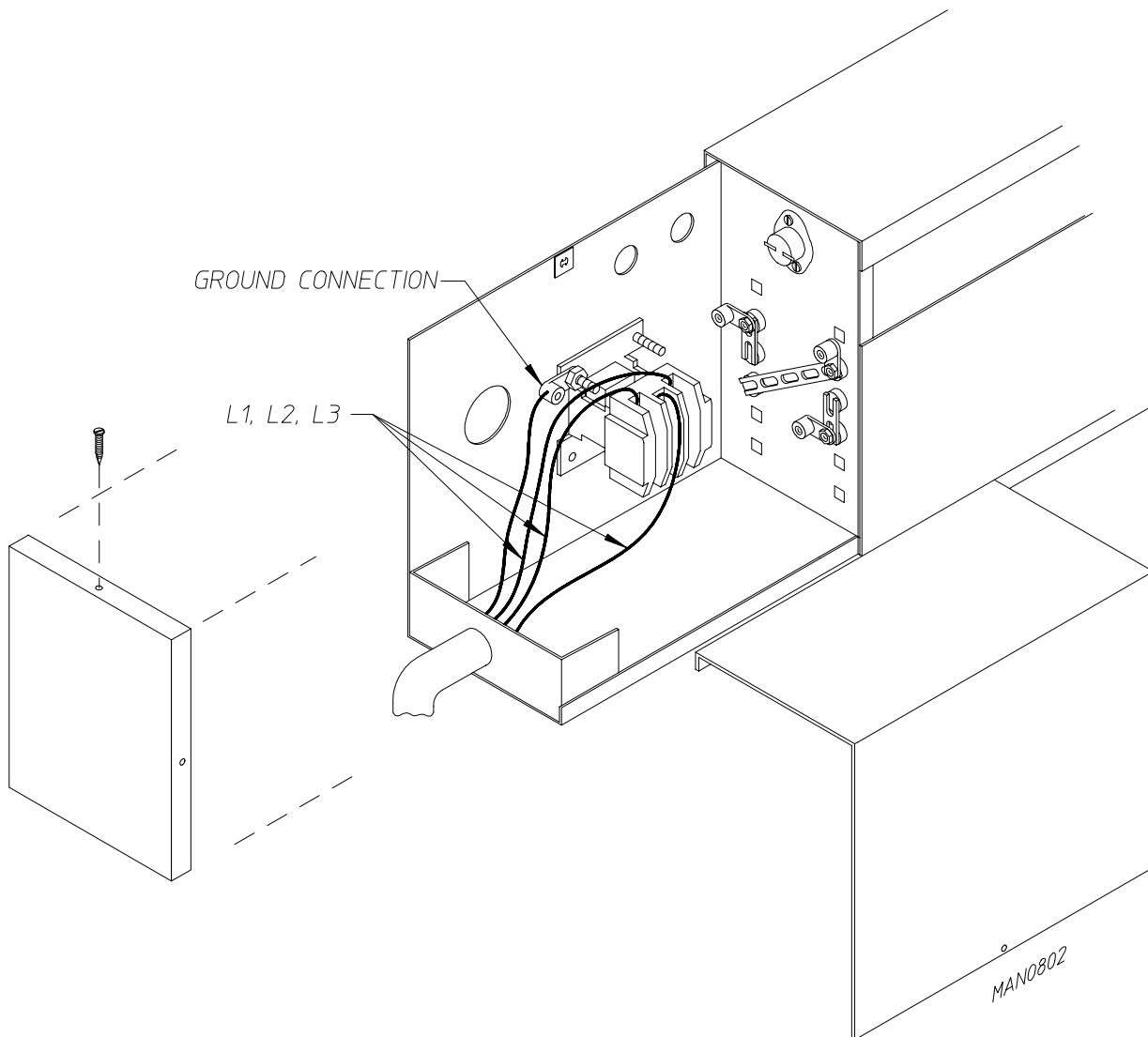
The only electrical input connections to the dryer are the 3-phase (3 $\phi$ ) power leads (L1,L2,L3 and sometimes neutral) and ground. Single-phase (1 $\phi$ ) power for the control circuit is done internally to the dryer. No single-phase (1 $\phi$ ) input connection is required on a 3-phase (3 $\phi$ ) dryer.

**CAUTION:** The dryer *must be* grounded. A ground lug has been provided for this purpose.

Input connection wiring **must be** sized properly to handle the dryer's current draw. This information is printed on the dryers data label.

**NOTE: A CIRCUIT SERVING EACH DRYER *MUST BE* PROVIDED.**

The electrical input connections are made at the electric oven contactor located inside the assembly at the rear center upper section of the dryer. The ground connection is made to a copper lug also provided in this area. To gain access, remove oven rear service cover.



**IMPORTANT:** A strain relief *must be* used where the input wiring enters the oven assembly.

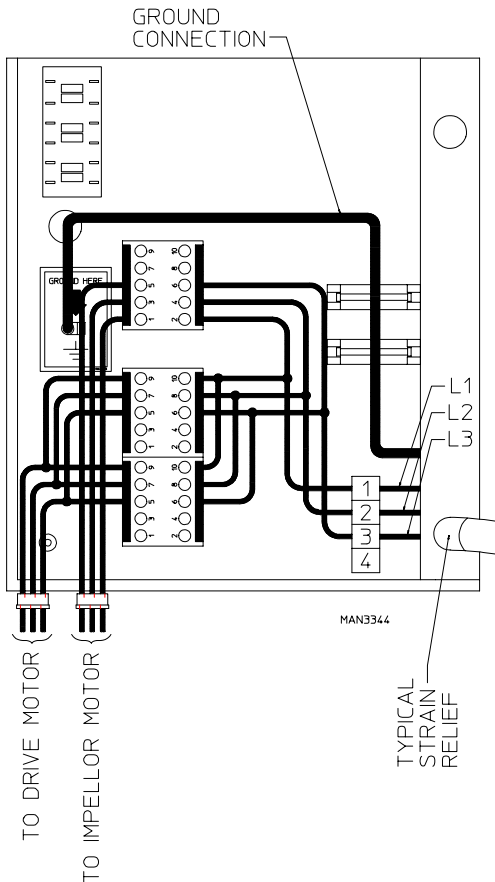
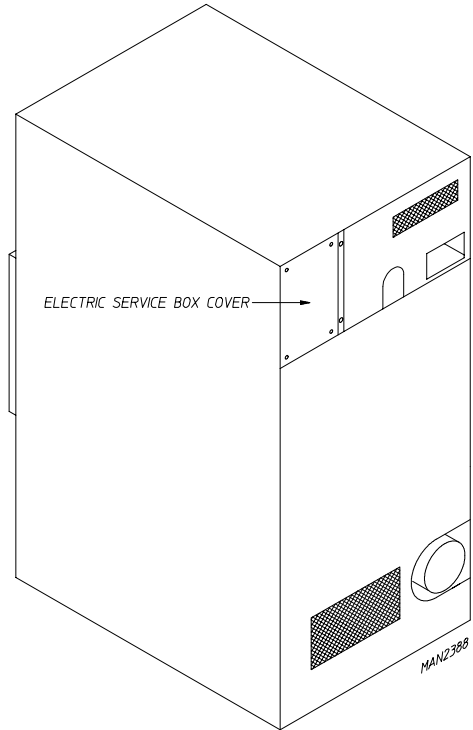
c. 3-Phase (3Ø) Wiring Connections (Hookup) - for REVERSING MODELS ONLY

The electrical connections on **ALL** 3-phase (3Ø) gas model and steam model dryers are made into the rear service box located at the upper left area of the dryer. Electrical connections for electrically heated dryers are made in the electric oven area located at the upper rear area of the dryer.

**NOTE: A CIRCUIT SERVING EACH DRYER *MUST BE* PROVIDED.**

If local codes permit, power to a gas or steam dryer can be made by the use of a flexible U.L. listed power cord/pigtail (wire size **must conform** to rating of dryer), or the dryer can be hard wired directly to the service breaker panel. In **ALL** cases, a strain relief **must be** installed where the wiring enters the dryer.

The only electrical input connections to the dryer are the 3-phase (3Ø) power leads (L1,L2,L3 and sometimes neutral) and ground. Single-phase (1Ø) power for the control circuit is done internally to the dryer. No single-phase (1Ø) input connection is required on a 3-phase (3Ø) dryer.



For gas model and steam model dryers manufactured for operation at 3-phase (3Ø), the electrical connections are made at the power distribution block located in the service box at the rear, upper left corner of the dryer. The ground connection is made to the copper lug also provided in this box. To gain access to the service box contactor, the service box cover **must be** removed.

## G. GAS INFORMATION

It is your responsibility to have **ALL** plumbing connections made by a qualified professional to assure that the gas plumbing installation is adequate and conforms with local and state regulations or codes. In the absence of such codes, **ALL** plumbing connections, materials, and workmanship **must conform** to the applicable requirements of the National Fuel Gas Code ANSI Z223.1-LATEST EDITION.

**IMPORTANT:** Failure to comply with these codes or ordinances, and/or the requirements stipulated in this manual, can result in personal injury and improper operation of the dryer.

The dryer and its individual shut-off valves **must be** disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.5 kPa). The dryer **must be** isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure test of the gas supply system at test pressures equal to or less than 1/2 psig (3.5 kPa).

**IMPORTANT:** Failure to isolate or disconnect dryer from supply as noted can cause irreparable damage to the gas valve which will VOID THE WARRANTY.

**WARNING: FIRE or EXPLOSION COULD RESULT.**

### 1. Gas Supply

The gas dryer installation **must meet** the American National Standard...National Fuel Gas Code ANSI Z223.1-LATEST EDITION, as well as local codes and ordinances and **must be** done by a qualified professional.

**NOTE:** Undersized gas piping will result in ignition problems, slow drying, increased use of energy, and can create a safety hazard.

The dryer **must be** connected to the type of heat/gas indicated on the dryer label affixed behind the right control box door. If this information does not agree with the type of gas available, **DO NOT operate the dryer**. Contact the distributor who sold the dryer or the **ADC** factory.

**IMPORTANT:** Any burner changes or conversions *must be* made by a qualified professional.

The input ratings shown on the dryer data label are for elevations up to 2,000 feet, unless elevation requirements of over 2,000 feet were specified at the time the dryer order was placed with the factory. The adjustment or conversion of dryers in the field for elevations over 2,000 feet are made by changing each burner orifice. If this conversion is necessary, contact the distributor who sold the dryer or contact the **ADC** factory.

2. Technical Gas Data

a. Gas Specifications

<b>Type of Gas</b>		
	Natural Gas	Liquid Propane Gas
Manifold Pressure*	3.5 - 4.0 inches W.C.	10.5 - 11.0 inches W.C.
Inline Pressure	6.0 - 12.0 inches W.C.	11.0 inches W.C.

\* Measured at the gas valve pressure tap when the gas valve is on.

b. Gas Connections:

Inlet connection ----- 3/4-inch N.P.T.

Inlet supply size ----- 3/4-inch N.P.T. (minimum)

Btu/hr input (per dryer) - 204,000

1) Natural Gas

Regulation is controlled by the dryer's gas valve's internal regulator. Incoming supply pressure **must be** consistent between a minimum of 6.0 inches and a maximum of 12.0 inches water column (W.C.) pressure.

2) Liquid Propane (L.P.) Gas

Dryers made for use with L.P. gas have the gas valve's internal pressure regulator blocked open so that the gas pressure **must be** regulated upstream of the dryer. The pressure measured at each gas valve pressure tap **must be** a consistent 11.0 inches water column (W.C.). There is no regulator or regulation provided in an L.P. dryer. The water column pressure **must be** regulated at the source (L.P. tank) or an external regulator **must be** added to each dryer.

		<b>Type of Gas</b>						L.P. Conversion Kit Part Number
MODEL NUMBER	BTU Per Hour Rating	Natural			Liquid Propane			
		Qty.	D.M.S.*	Part Number	Qty.	D.M.S.*	Part Number	
ADG-78	204,000	4	#29	140820	4	#47	140805	881655

\* D.M.S. (Drill Material Size) equivalents are as follows:

Natural Gas ..... #29 = .1360"

Liquid Propane Gas ... #47 = .0785"

### 3. Piping/Connections

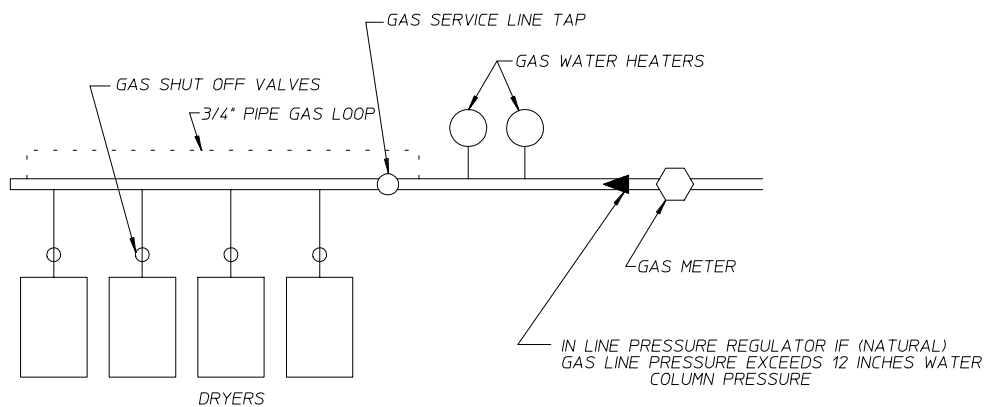
**ALL** components/materials **must conform** to National Gas Code specifications. It is important that gas pressure regulators meet applicable pressure requirements and that gas meters be rated for the total amount of **ALL** the appliance BTU's being supplied.

The dryer is provided with a 3/4" N.P.T. inlet pipe connection located at the right side of the base of the dryer. The minimum pipe size (supply line) to the dryer is 3/4" N.P.T. For ease servicing, the gas supply line of each dryer **must have** its own shut-off valve.

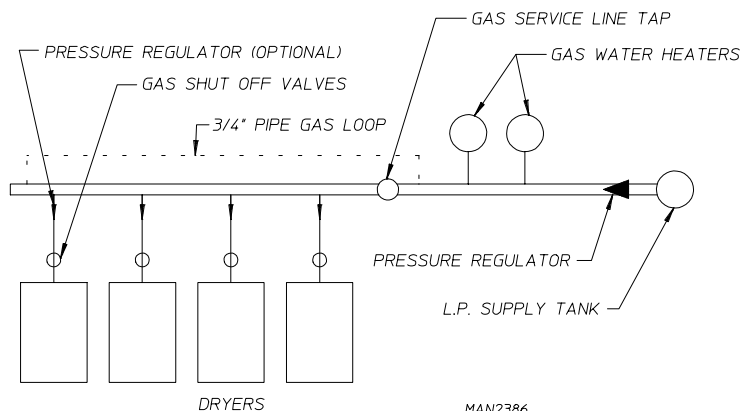
The size of the main gas supply line (header) will vary depending on the distance this line travels from the gas meter or, in the case of L.P. (liquid propane) gas, the supply tank, other gas-operated appliances on the same line, etc. Specific information regarding supply line size **should be** determined by the gas supplier.

**NOTE:** Undersized gas supply piping can create a low or inconsistent pressure which will result in erratic operation of the burner ignition system.

TYPICAL NATURAL GAS INSTALLATION



TYPICAL L.P. GAS INSTALLATION



MAN2386



Consistent gas pressure is essential at **ALL** gas connections. It is recommended that a 2-inch pipe gas loop be installed in the supply line serving a bank of dryers. An in-line pressure regulator **must be** installed in the gas supply line (header) if the (natural) gas pressure exceeds 12.0 inches of water column pressure.

**NOTE:** A water column test pressure of 3.5-4.0 inches for natural gas and 11.0 inches for L.P. (liquid propane) dryers is required at the gas valve pressure tap of each dryer for proper and safe operation.

A 1/8" N.P.T. plugged tap, accessible for a test gauge connection, **must be** installed in the main gas supply line immediately upstream of each dryer.

**IMPORTANT:** Pipe joint compounds that resist the action of natural gas and L.P. gas **must be** used.

**IMPORTANT:** Test **ALL** connections for leaks by brushing on a soapy water solution (liquid detergent works well).

**WARNING: NEVER TEST FOR LEAKS WITH A FLAME!!!**

**ALL** components/materials **must conform** to National Gas Code specifications. It is important that gas pressure regulators meet applicable pressure requirements and that gas meters be rated for the total amount of **ALL** the appliance BTU's being supplied.

**IMPORTANT:** The dryer and its individual shut-off valve **must be** disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.5 kPa).

**NOTE:** The dryer **must be** isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure test of the gas supply system at test pressures equal to or less than 1/2 psig (3.5 kPa).

## H. STEAM INFORMATION

It is your responsibility to have **ALL** plumbing connections made by a qualified professional to assure that the gas plumbing installation is adequate and conforms with local and state regulations or codes.

**IMPORTANT:** Failure to comply with the requirements stipulated in this manual can result in component failure which will VOID THE WARRANTY.

**NOTE:** The ADS-78 is manufactured with a pneumatic (piston) damper system which requires an external supply of clean, dry, regulated air (80 PSI +/- 10 PSI).

### 1. Steam Coil PH Level

The normal PH level for copper type steam coils **must be** maintained between a value of 8.5 to 9.5. For steel type steam coils the PH level **must be** maintained between a value of 9.5 to 10.5. These limits are set to limit the acid attack of the steam coils.

**IMPORTANT:** Coil failure due to improper PH level will VOID THE WARRANTY.

### 2. Steam Requirements - High Pressure

Inlet ----- 1" supply line connection -- qty. one (1) at top manifold.  
Return ----- 1" return line connection --- qty. one (1) at bottom manifold.

Operating Steam Pressure	
Maximum	125 psig
Minimum	100 psig
Heat Input (Normal Load)	7 Bhp
Consumption (approximate)	239 lbs/hr

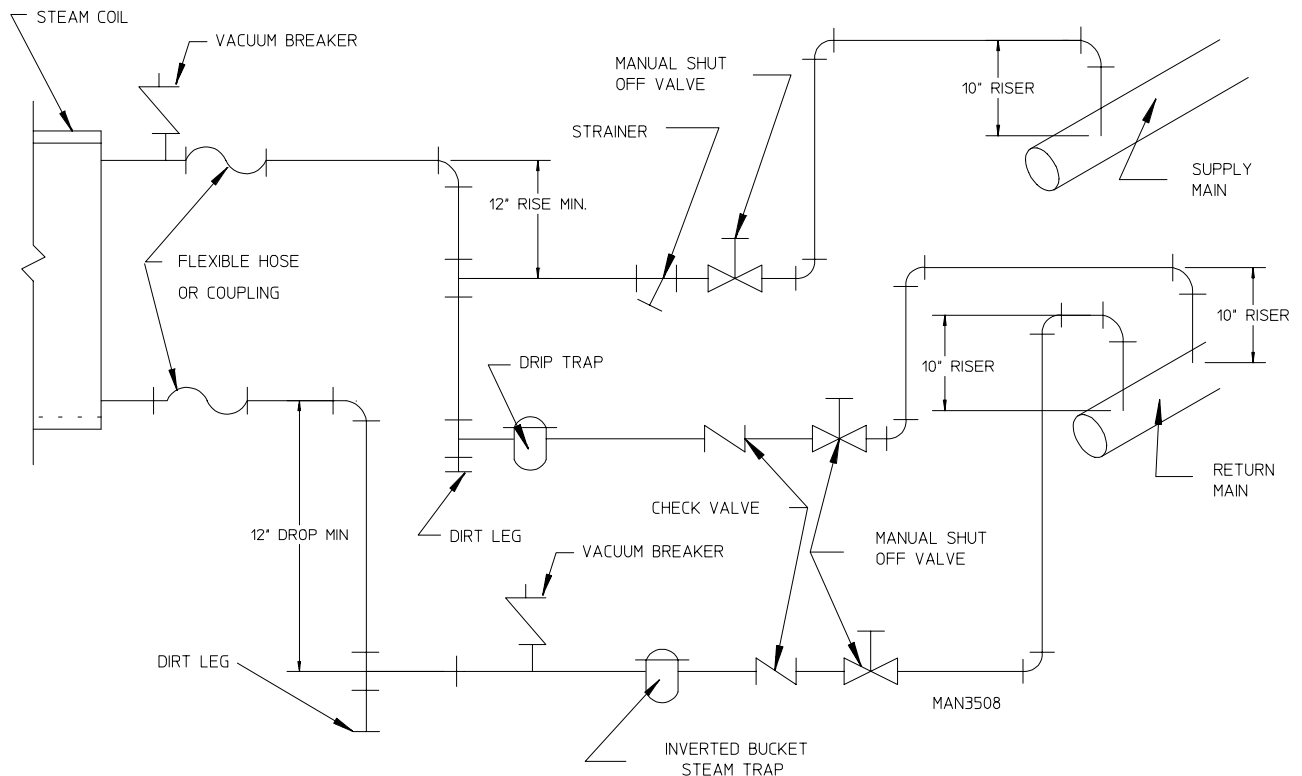
### 3. Installation Instructions

To insure an adequate supply of steam is provided, be sure that the steam lines and steam return lines are sized and laid out as stipulated in this manual. Inadequate steam lines and steam return lines or improper steam plumbing will result in poor performance and can cause component failure. Clean, dry steam **must be** provided to the dryer.

**IMPORTANT:** Steam coil failure due to water hammer by wet steam will VOID THE WARRANTY.

- a. The pressure of the condensate in the steam supply will cause water hammer and subsequent heat exchanger (steam coil) failure. The steam supply connection into the main supply line **must be** made with a minimum 12-inch riser. This will prevent any condensate from draining towards the dryer.
- b. The steam supply piping to the dryer must include a 12-inch rise along with a drip trap and check valve. This will prevent any condensate from entering the steam coil.

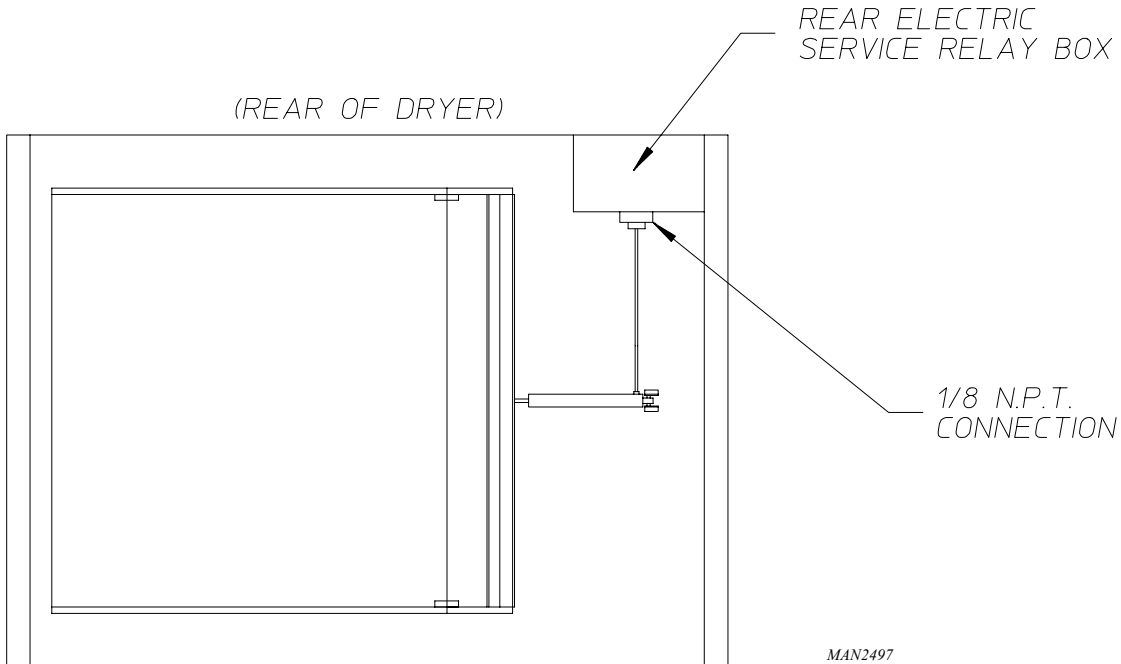
- c. Flexible hoses or couplings **must be** used. The dryer vibrates slightly when it runs and this will cause the steam coil connections to crack if they are hard piped to the supply and return mains.
- d. Shut-off valves for each dryer **should be** installed in the supply line, return line, and drip trap return line. This will allow the dryer to be isolated from the supply main and the return main if the dryer needs maintenance work.
- e. Install an inverted bucket steam trap and check valve at least 12-inches below the steam coil as close to the coil as possible.
  - 1) A trap with capacity of 1,200 pounds of condensate per hour at 125 psi is needed for each unit.
- f. The supply line and the return line **should be** insulated. This will save energy and provide for the safety of the operator and maintenance personnel.
- g. Water pockets in the supply line, caused by low points, will provide wet steam to the coil possibly causing steam coil damage. **ALL** horizontal runs of steam supply piping **should be** pitched 1/4-inch for every one (1) foot back towards the steam supply header causing the condensate in the line to drain to the header. Install a bypass trap in any low point to eliminate wet steam.



## STEAM DAMPER SYSTEM

#### 4. Steam Damper Air System Connections

The ADS-78 is manufactured with a pneumatic (piston) damper system which requires an external supply of compressed air. The air connection is made to the steam damper solenoid valve which is located at the rear inner top area of the dryer just in front of the electric service relay box.



##### a. Air Requirements

Compressed Air Supply	Air Pressure
Normal	80 PSI
Minimum Supply	70 PSI
Maximum Supply	90 PSI

##### b. Air Connection

Air connection to system --- 1/8-inch N.P.T.

c. No air regulator or filtration is provided with the dryer. External regulation/filtration of 80 psi **must be** provided. It is suggested that a regulator/filter gauge arrangement be added to the compressed air line just before the dryer connection. This is necessary to insure that correct and clean air pressure is achieved.

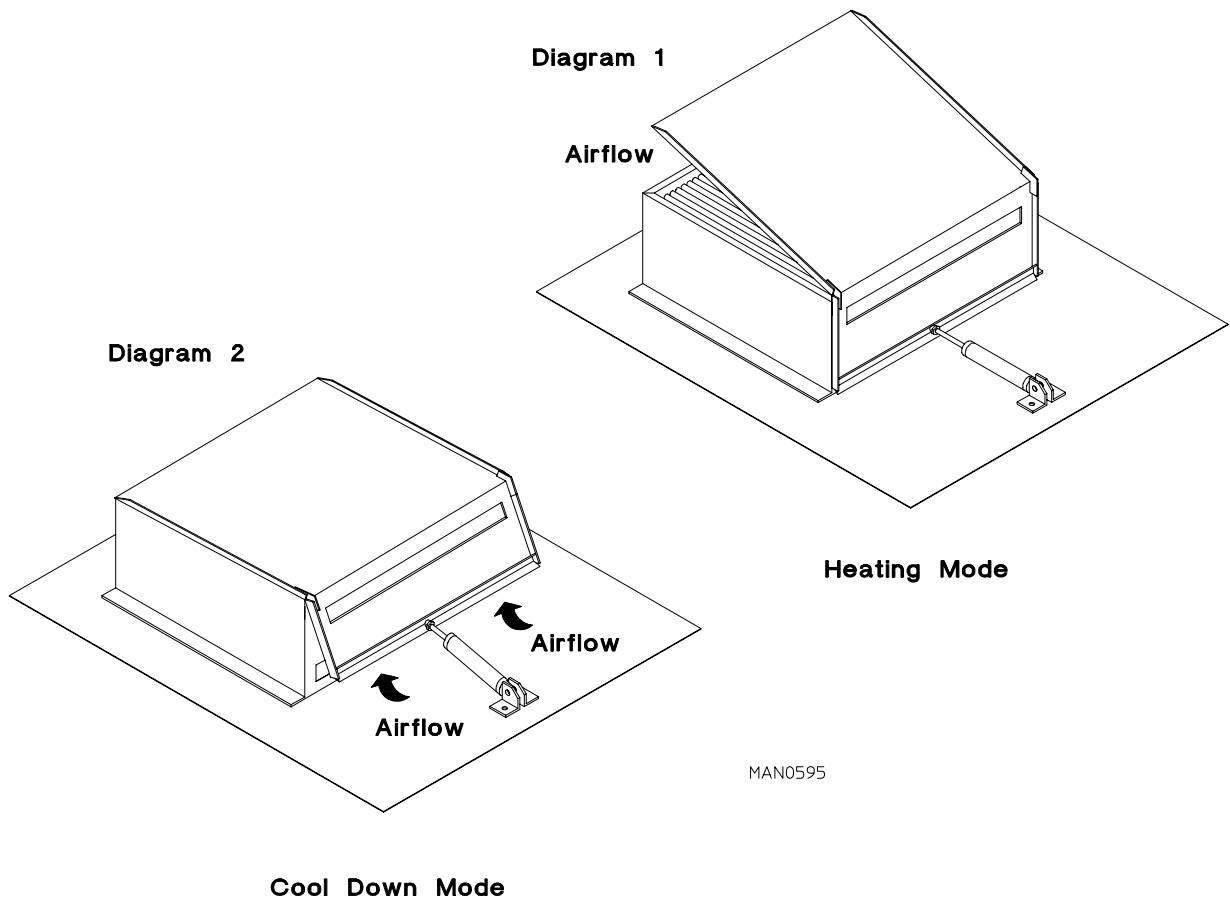
## 5. Steam Damper System Operation

The ADS-78 steam damper shown in Diagram 1 in the illustration below, allows the coil to stay constantly charged eliminating repeated expansion and contraction. When the damper is opened, the air immediately passes through the already hot coil, providing instant heat to start the drying process. When the damper is closed, ambient air is drawn directly into the basket (tumbler), allowing a rapid cool down (Diagram 2).

**Diagram 1** shows the damper in the heating (open) mode, allowing heat into the tumbler.

**Diagram 2** shows the damper in the cool down (closed) mode, pulling ambient air directly into the basket (tumbler) without passing through the coils.

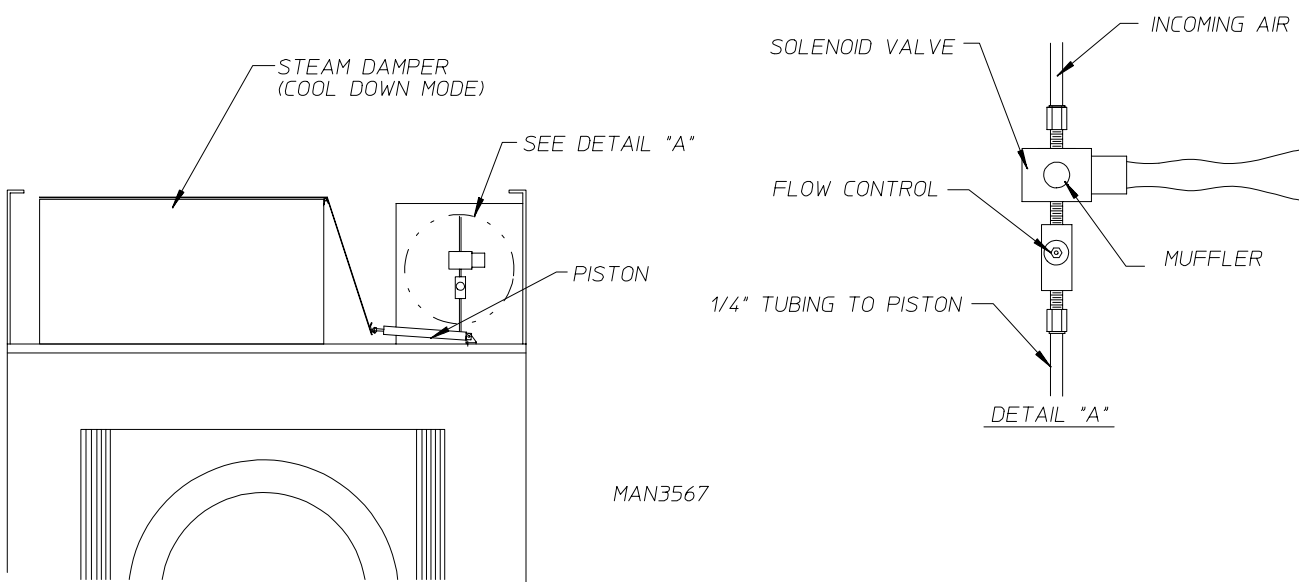
**NOTE:** With the dryer off or with no air supply, the steam damper is in cool down mode as shown in Diagram 2.



## 5. Steam Damper Air Piston (Flow Control) Operation Adjustment

Although the steam damper operation was tested and adjusted prior to shipping at 80 PSI, steam damper operation **must be** checked before the dryer is put into operation. Refer to **page 33** or instructions to check steam damper operation. If steam damper adjustment is necessary, locate the flow control valve and make the necessary adjustments as noted below.

NOTE:  
TURNING KNOB ON FLOW CONTROL CLOCKWISE WILL RESTRICT AIR FLOW. TURNING COUNTER-CLOCKWISE WILL ALLOW HIGHER AIR FLOW.



## I. PREPARATION FOR OPERATION/START-UP

The following items **should be** checked before attempting to operate the dryer:

1. Read **ALL** "CAUTION," "WARNING," and "DIRECTION" labels attached to the dryer.
2. Check incoming supply voltage to be sure that it is the same as indicated on the dryer data label affixed to the back side of the top front control/service door. In the case of 208 VAC or 230/240 VAC ***THE SUPPLY VOLTAGE MUST MATCH THE ELECTRIC SERVICE EXACTLY.***
3. GAS MODELS - check to assure that the dryer is connected to the type of heat/gas indicated on the dryer data label.
4. GAS/ELECTRIC MODELS - the sail switch damper assembly was installed and pre-adjusted at the factory prior to shipping. However, each sail switch adjustment **must be** checked to assure that this important safety control is functioning.
5. GAS MODELS - be sure that **ALL** gas shut-off valves are in the open position.
6. Be sure **ALL** back panels (guards) and electric box covers have been replaced.
7. Check **ALL** service doors to assure that they are closed and secured in place.
8. Be sure the lint drawer is securely in place.
9. Rotate the basket (tumbler/drum) by hand to be sure it moves freely.
10. Check bolts, nuts, screws, terminals, and fittings for security.
11. STEAM MODELS - check to insure air supply (80 PSI) is connected to the dryer.
12. STEAM MODELS - check to insure **ALL** steam shut-off valves are open.
13. STEAM MODELS - check steam damper operation.
14. Check tumbler bearing set screws to insure they are **ALL** tight.

## J. PREOPERATIONAL TESTS

**ALL** dryers are thoroughly tested and inspected before leaving the factory. However, a preoperational test **should be** performed before the dryer is publicly used. It is possible that adjustments have changed in transit or due to marginal location (installation) conditions.

1. Turn on electric power to the dryer.
  - a. Open **ALL** shut-off valves (for Gas Models and Steam Models ONLY)
2. Refer to the Operating Instructions for starting your particular model dryer.
  - a. Gas Models
    - 1) When the dryer is first started (during initial start-up), the burner has a tendency not to ignite on the first attempt. This is because the gas supply piping is filled with air, so it may take a few minutes for this air to be purged from the lines.

**NOTE:** During the purging period, check to be sure that **ALL** gas shut-off valves are open.

**NOTE:** Gas dryers are equipped with a Hot Surface Ignition (HSI) system which has internal diagnostics. If ignition is not established within three times the heat circuit in the HSI module will "LOCK-OUT" until it is manually reset. To reset the HSI system, open and close the main door and restart the dryer.

- 2) A gas pressure test **should be** taken at the gas valve pressure tap of each dryer to assure that the water column pressure is correct and consistent.

**NOTE:** Water column pressure requirements (measured at the gas valve pressure tap)...

Natural Gas ----- 3.5 - 4.0 Inches W.C.  
L.P. Gas ----- 10.5 - 11.0 Inches W.C.

**IMPORTANT:** There is no regulator provided in an L.P. dryer. The water column pressure **must be** regulated at the source (L.P. tank), or an external regulator **must be** added to each dryer.

- b. Steam Models
  - 1) Check to insure that steam damper is functioning properly.
    - a) The steam damper should not "slam" (open or closed) when it reaches the end of (piston) travel. Additionally, the steam damper should not bind and/or stop during travel. If either of these conditions occur, the flow control **must be** adjusted. Refer to the **illustration** on **page 34** for air adjustment instructions.



c. Electric Models

1) Check to insure that electric oven/contacter assembly is activating.

3. Make a complete operational check of **ALL** safety related circuits:

a. Door Switch(es)

b. Hi-Limit Thermostats

c. Sail Switch (for Gas Models and Electric Models ONLY)

**NOTE:** To check for proper sail switch operation (for Gas Models and Electric Models ONLY), open the main door and while holding main door switch plunger in, start the dryer. Dryer should start but heat circuit **should not be** activated (on). If the heat system is activated, the sail switch is improperly adjusted and **must be** adjusted by bending the actuator arm of the sail switch toward the burner box. If the actuator arm is bent too far toward the burner box of the dryer, the dryer may not have heat when needed. After any adjustment to the sail switch, the above procedure **must be** repeated to verify proper operation of the sail switch.

4. The dryer **should be** operated through one (1) complete cycle to assure that no further adjustments are necessary and that **ALL** components are functioning properly.

**IMPORTANT:** The dryer basket (tumbler) is treated with a protective coating. **ADC** suggests tumbling old clothes or material in the basket (tumbler), using a mild detergent to remove the protective coating.

5. Make a complete operational check of **ALL** operating controls.

a. For microprocessor models check controller (computer) programs/selections...

1) Each microprocessor controller (computer) has been preprogrammed by the factory with the most commonly used parameter (program) selections. If computer program changes are required, refer to the computer programming manual which was shipped with the dryer.

6. Check the electric service phase sequence (3-phase [3 $\phi$ ] models only). While the dryer is operating, check to see if the blower wheel (impeller/fan) is rotating in the proper direction. Looking from the front, the blower wheel (impeller/fan) should spin in the clockwise (CW) direction. If it is, the phasing is correct. If the phasing is incorrect, reverse two (2) of the three (3) leads at connections L1, L2, L3 of the power supply to the dryer.

**IMPORTANT:** If the blower wheel (impeller/fan) is rotating in the wrong direction, this will not only drastically reduce drying efficiency, but it can also cause premature component failure.

7. REVERSING MODELS ONLY - basket (tumbler) dryer **should never be** operated with less than a 30 lb. load (dry weight). The size of the load will affect the coast-down and dwell (stop) times. The basket (tumbler) must come to a complete stop before starting in opposite direction.

a. Microprocessor Models

- 1) Spin Times and Stop Times **are not adjustable** in the Automatic Mode and have been preprogrammed into the microprocessor controller (computer) for 120-seconds spin time and a 5-second dwell (stop) time.
- 2) Spin Times and Stop Times **are adjustable** in the Manual (timed) Mode.

b. Dual Timer Models

- 1) Both dwell (stop) time and basket (tumbler) spin time are adjustable (refer to the **illustration on page 65**).

8. Check to insure that **ALL** set screws (i.e., tumbler drive, idler, etc.) are tight.

## K. PREOPERATIONAL INSTRUCTIONS

1. To start the dryer...

a. Microprocessor (computer) dryers...

- 1) The L.E.D. (light emitting diode) display will read "FILL".
- 2) Press the "E" on the touchpad of the keyboard.
- 3) The L.E.D. display will quickly show "Ld30", "F180". The dryer will start, and the L.E.D. display will show "dr30".

Refer to the User's Manual for detailed operating instructions.

b. Dual Timer dryers...

- 1) Turn drying timer knob for a time of 20 minutes.
- 2) Select "High Temp."
- 3) Push "Push To Start" switch.
- 4) To stop dryer, open the main door.

## L. SHUT DOWN INSTRUCTIONS

If the dryer is to be shut down (taken out of service) for a period of time, the following **MUST BE** performed;

1. Discontinue power to the dryer either at the external disconnect switch or the circuit breaker.
2. Discontinue the heat supply:
  - a. ***GAS MODELS*** ... discontinue the gas supply.
    - 1) **SHUT OFF external gas supply shut-off valve.**
    - 2) **SHUT OFF internal gas supply shut-off valve located in the gas valve burner area.**
  - a. ***STEAM MODELS*** ... discontinue the steam supply.
    - 1) **SHUT OFF external (location furnished) shut-off valve.**
    - 2) **SHUT OFF internal steam valves in the supply lines and the return lines.**

# SECTION IV

## SERVICE/PARTS INFORMATION

### A. SERVICE

1. Service **must be** performed by a qualified trained technician, service agency, or gas supplier. If service is required, contact the distributor from whom the **ADC** equipment was purchased. If the distributor cannot be contacted or is unknown, contact the **ADC** Service Department for a distributor in your area.

**NOTE:** When contacting the **ADC** Service Department, be sure to give them the correct **model number** and **serial number** so that your inquiry is handled in an expeditious manner.

### B. PARTS

1. Replacement parts **should be** purchased from the distributor from whom the **ADC** equipment was purchased. If the distributor cannot be contacted or is unknown, contact the **ADC** Parts Department for a distributor in your area. Parts may also be purchased directly from the factory by calling the **ADC** Parts Department at (508) 678-9010 or you may FAX in your order at (508) 678-9447.

**NOTE:** When ordering replacement parts from the **ADC** dealer or the **ADC** factory be sure to give them the correct **model number** and **serial number** so that your parts order can be processed in an expeditious manner.

# SECTION V

## WARRANTY INFORMATION

### A. RETURNING WARRANTY CARD(S)

1. Before any dryer leaves the **ADC** factory test area, a warranty card (**ADC** Part No. 112254) is placed on the back side of the main door glass. These warranty cards are intended to serve the customer where we record the individual installation date and warranty information to better serve you should you file a warranty claim.
  - a. If a warranty card (**ADC** Part No. 112254) did not come with your dryer, contact the **ADC** Warranty Department or **ADC** Service Department at (508) 678-9000.

### B. PARTS

For a copy of the **ADC** commercial warranty covering your particular dryer(s), contact the **ADC** distributor from whom you purchased the equipment and request dryer warranty form **ADC** Part No. 450199. If the distributor cannot be contacted or is unknown, warranty information can be obtained from the factory by contacting the **ADC** Warranty Department at (508) 678-9000.

**NOTE:** Whenever contacting the **ADC** factory for warranty information, be sure to have the dryer's **model number** and **serial number** available so that your inquiry can be handled in an expeditious manner.

### C. RETURNING WARRANTY PARTS

**ALL** dryer or parts warranty claims or inquires **should be** addressed to the **ADC** Warranty Parts Department. To expedite processing, the following procedures **must be** followed:

1. No parts are to be returned to **ADC** without prior written authorization ("Return Material Authorization") from the factory.

**NOTE:** An R.M.A. ("Return Material Authorization") is valid for only sixty (60) days from date of issue.

- a. The R.M.A. issued by the factory, as well as any other correspondence pertaining to the returned part(s), **must be** included inside the package with the failed merchandise.

2. Each part **must be** tagged with the following information:
  - a. **Model number** and **serial number** of the dryer from which part was removed.
  - b. Nature of failure (be specific).
  - c. Date of dryer installation.
  - d. Date of part failure.
  - e. Specify whether the part(s) being returned is for a replacement, a credit, or a refund.

**NOTE:** If a part is marked for a credit or a refund, the invoice number covering the purchase of the replacement part **must be** provided.

**NOTE:** Warranty tags (ADC Part No. 450064) are available at "no charge" from ADC upon request.

3. The company returning the part(s) must clearly note the complete company name and address on the outside of the package.
4. **ALL** returns **must be** properly packaged to insure that they are not damaged in transit. *Damage claims are the responsibility of the shipper.*

**IMPORTANT:** No replacements, credits or refunds will be issued for merchandise damaged in transit.

5. **ALL** returns **should be** shipped to the ADC factory in such a manner that they are insured and a proof of delivery can be obtained by the sender.
6. **Shipping charges are not the responsibility of ADC. ALL returns should be "prepaid" to the factory. Any "C.O.D. or "COLLECT" returns will not be accepted.**

**IMPORTANT:** No replacements, credits, or refunds will be issued if the claim **cannot** be processed due to insufficient information. The party filing the claim will be notified in writing, either by "FAX" or "CERTIFIED MAIL - Return Receipt Requested," as to the information necessary to process claim. If reply *is not* received by the ADC Warranty Department within thirty (30) days from the FAX/letter date, then no replacement, credit, or refund will be issued, and the merchandise **will be discarded**.

# SECTION VI

## ROUTINE MAINTENANCE

### A. CLEANING

A program and/or schedule **should be** established for periodic inspection, cleaning, and removal of lint from various areas of the dryer, as well as throughout the duct work system. The frequency of cleaning can best be determined from experience at each location. Maximum operating efficiency is dependent upon proper air circulation. The accumulation of lint can restrict this air flow. If the guidelines in this section are met, an ADC dryer will provide many years of efficient, trouble-free, and - most importantly - safe operation.

**WARNING: LINT FROM MOST FABRICS IS HIGHLY COMBUSTIBLE. THE ACCUMULATION OF LINT CAN CREATE A POTENTIAL FIRE HAZARD.**

**WARNING: KEEP DRYER AREA CLEAR AND FREE FROM COMBUSTIBLE MATERIALS, GASOLINE, and OTHER FLAMMABLE VAPORS and LIQUIDS.**

**NOTE:** Suggested time intervals shown are for average usage which is considered six (6) to eight (8) operational (running) hours per day.

#### *SUGGESTED CLEANING SCHEDULE*

##### *EVERY THIRD or FOURTH LOAD*

Clean the lint screen every third or fourth load. A clogged lint screen will cause poor dryer performance. The lint screen is located behind the lint door in the base of the dryer. Open the lint door, brush the lint off of the lint screen, and remove the lint. Inspect the lint screen and replace if torn.

**NOTE:** The frequency of cleaning the lint screens can best be determined from experience at each location.

##### *WEEKLY*

Clean lint accumulation from the lint chamber, thermostat, and microprocessor temperature sensor (sensor bracket) area.

**WARNING: TO AVOID HAZARD OF ELECTRICAL SHOCK, DISCONTINUE ELECTRICAL POWER SUPPLY TO THE DRYER.**

## ***STEAM DRYERS***

Clean the steam coil fins. Suggest using compressed air and a vacuum cleaner with brush attachment.

**NOTE:** *When cleaning steam coil fins, be careful not to bend the fins.* If the fins are bent, straighten by using a *fin comb*, which is available from any local air conditioning supply house.

### ***90 DAYS***

1. Remove lint from around basket (tumbler), drive motors, and surrounding areas.
2. Remove lint from gas valve burner area with a dusting brush or vacuum cleaner attachment.
3. Clean any lint accumulation in and around both the blower and drive motor casing openings.

**NOTE:** To prevent damage, avoid cleaning or touching the hot surface ignitor assembly.

### ***EVERY 6 MONTHS***

Inspect and remove lint accumulation in customer furnished exhaust duct work system and from dryers internal exhaust ducting.

**NOTE: THE ACCUMULATION OF LINT IN THE EXHAUST DUCT WORK CAN CREATE A POTENTIAL FIRE HAZARD.**

**NOTE: *DO NOT* OBSTRUCT THE FLOW OF COMBUSTION and VENTILATION AIR. CHECK CUSTOMER FURNISHED BACK DRAFT DAMPERS IN THE EXHAUST DUCT WORK. INSPECT and REMOVE ANY LINT ACCUMULATION WHICH CAN CAUSE THE DAMPER TO BIND or STICK.**

**NOTE:** A back draft damper that is sticking partially closed can result in slow drying and shut-down of heat circuit safety switches or thermostats

**NOTE:** When cleaning the dryer cabinet(s), avoid using harsh abrasives. A product intended for the cleaning of appliances is recommended.

## **B. ADJUSTMENTS**

### ***7 DAYS AFTER INSTALLATION and EVERY 6 MONTHS THEREAFTER***

Inspect bolts, nuts, screws, (bearing set screws), non-permanent gas connections (unions, shut-off valves, orifices, and grounding connections). Motor and drive belts **should be** examined. Cracked or seriously frayed belts **should be** replaced. Tighten loose V-belts when necessary. Complete operational check of controls and valves. Complete operational check of **ALL** safety devices (door switches, lint drawer switch, sail switch, burner and hi-limit thermostats).



# SECTION VII

## TROUBLESHOOTING

**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.**

The information provided will help isolate the most probable component(s) associated with the difficulty described. The experienced technician realizes, however, that a loose connection or broken/shorted wire may be at fault where electrical components are concerned .. not necessarily the suspect component itself. Electrical parts **should always be** checked for failure before being returned to the factory.

**IMPORTANT:** When replacing blown fuses, the replacement *must be* of the exact rating as the fuse being replaced. The information provided *should not* be misconstrued as a handbook for use by an untrained person in making repairs.

**WARNING:** ALL SERVICE and TROUBLESHOOTING **SHOULD BE** PERFORMED BY A QUALIFIED PROFESSIONAL or SERVICE AGENCY.

**WARNING:** WHILE MAKING REPAIRS, OBSERVE ALL SAFETY PRECAUTIONS DISPLAYED ON THE DRYER or SPECIFIED IN THIS MANUAL.

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## ***MICROPROCESSOR (Computer) MODELS***

### **A. No L.E.D. (light emitting diode) display (for microprocessor [computer] models ONLY)...**

1. Service panel fuse blown or tripped breaker.
2. Blown control circuit L1 or L2 1/2-amp (slo blo) fuse.
3. Failed microprocessor controller (computer).
4. Failed control step down transformer (*for 380 volts or higher models ONLY*).

### **B. Drive motor is not operating (does not start)...**

1. Microprocessor controller (computer) motor indicator dot and relay output L.E.D. indicator dots are on ...
  - a. Failed drive motor contactor (relay).
  - b. Failed arc suppressor (A.S.) board (*for Reversing Models ONLY*).
  - c. Failed drive motor.
2. Microprocessor controller (computer) motor indicator dot and relay output L.E.D. indicator dots are on, but motor output L.E.D. indicator is off ...
  - a. Failed microprocessor controller (computer).

### **C. Drive motor (*Reversing Models ONLY*) operates in one direction only ... stops and restarts in the same direction...**

1. Failed reversing contactor (relay).
2. Failed arc suppressor (A.S.) board.
3. Failed microprocessor controller (computer)...check output indicator.

### **D. Drive motor operates okay for a few minutes, then stops and will not restart...**

1. Motor is overheating and tripping out on internal overload protector ...
  - a. Motor air vents clogged with lint.
  - b. Low voltage to motor.
  - c. Failed motor.
  - d. Tumbler (basket) is binding...check for an obstruction.
  - e. Failed idler bearings or tumbler bearings.
  - f. Failed blower (impellor/fan)...out of balance (*for Non-Reversing Models ONLY*).

**E. Blower/Fan motor is not operating (does not start)...**

1. Microprocessor controller (computer) motor indicator dot and relay output L.E.D. (light emitting diode) indicator dots are on ...
  - a. Failed blower (impellor/fan) motor contactor (relay).
  - b. Failed arc suppressor (A.S.) board.
  - c. Failed blower (fan/impellor) motor.
2. Microprocessor controller (computer) "door" L.E.D. is on but motor output L.E.D. indicator is off ...
  - a. Failed microprocessor controller (computer).

**F. Blower/Fan motor (*Reversing Models ONLY*) operates okay for a few minutes, then stops and will not restart...**

1. Motor is overheating and tripping out on internal overload protector ...
  - a. Motor air vents clogged with lint.
  - b. Low voltage to motor.
  - c. Failed motor.
  - d. Failed blower (impellor/fan)...out of balance.

**G. Both drive motor and blower (impellor/fan) motor (*Reversing Models ONLY*) not operating (does not start) ... microprocessor (computer) motor indicator dots and relay output L.E.D. (light emitting diode) indicators are on...**

1. Failed arc suppressor (A.S.) board.
2. Failed contactors (both blower [fan/impellor] and drive ).
3. Failed motors (both blower [fan/impellor] motor and drive motor).

**H. Both drive motor and blower (impellor/fan) motor (*Reversing Models ONLY*) not operating (does not start) ... microprocessor (computer) L.E.D. motor indicator dots and the "door" L.E.D. indicator are on but the relay output L.E.D. indicators are off (microprocessor controller [computer] L.E.D. display does not read "door")...**

1. Failed microprocessor controller (computer).

**I. Both drive motor and blower (impellor/fan) motor run a few minutes and stop ... microprocessor (computer) L.E.D. display continue to read time or percent of extraction and ALL indicator dots are off...**

1. Fault in main door switch circuit ...

- a. Main door switch circuit out of adjustment.
- b. Loose connection in main door switch circuit.

**J. Microprocessor (computer) L.E.D. (light emitting diode) display reads "dSFL" continuously and the buzzer (tone) sounds every 30 seconds...**

1. Fault in microprocessor heat sensing circuit.
  - a. Blown "dSFL" 1/8-amp fuse on the microprocessor controller (computer).
  - b. Failed microprocessor temperature sensor.
  - c. Failed microprocessor controller (computer).
  - d. Broken wire or connection somewhere between the microprocessor controller (computer) and the microprocessor temperature sensor.

**K. Microprocessor controller (computer) L.E.D. display reads "door" and the microprocessor (computer) "DOOR" L.E.D. indicator *is off*...**

1. Fault (open circuit) in main door/lint drawer switch circuit ...
  - a. Main door not closed all the way.
  - b. Main door switch is out of proper adjustment.
  - c. Failed lint main door switch.
  - d. Broken wire/connection in main door wiring circuit.

2. Failed 24 VAC step down transformer.

**L. Microprocessor controller (computer) L.E.D. (display reads "door" and the microprocessor (computer) "DOOR" L.E.D. indicator *is on*...**

1. Failed microprocessor controller (computer).

**M. Microprocessor controller (computer) will not accept any keyboard [touchpad] entries, (i.e., L.E.D. display reads "FILL" and when keyboard [touchpad] entries are selected, the L.E.D. display continues to read "FILL")...**

1. Failed keyboard label (touchpad) assembly.
2. Failed microprocessor controller (computer).

**N. Microprocessor controller (computer) will only accept certain keyboard (touchpad) entries...**

1. Failed keyboard label (touchpad) assembly.

**O. Microprocessor controller (computer) locks up and L.E.D. (light emitting diode) display reads erroneous message(s) or only partial segments...**

1. Transient power voltage spikes...disconnect the electrical power to the dryer, wait one (1) minute and reestablish power to the dryer. If problem is still evident ...
  - a. Failed microprocessor controller (computer).
  - b. Failed keyboard label (touchpad) assembly.

**P. Dryer stops during a cycle, microprocessor controller (computer) buzzer (tone) sounds for 5 seconds, and then the L.E.D. display reads “dSFL” for approximately 30 seconds, and then returns to “FILL”...**

1. Loose connection somewhere between the microprocessor controller (computer) and the microprocessor temperature sensor.
2. Loose "dSFL" 1/8-amp fuse on the microprocessor controller (computer).

**Q. Dryer stops during a cycle, microprocessor controller (computer) buzzer (tone) sounds for 5 seconds, and then the L.E.D. returns to “FILL”...**

1. Loose connection somewhere in the main power circuit to the microprocessor controller (computer).
2. Failed arc suppressor (A.S.) board.

**R. Microprocessor controller (computer) L.E.D. display reads “SEFL”...**

1. Rotational sensor circuit failure...fault somewhere in the tumbler (basket) rotation or circuit ...
  - a. Tumbler (basket) not rotating ...
    - 1) Broken or loose V-belts.
    - 2) Failure in drive motor circuit...refer to **Section B**, **Section C**, and **Section D** on page 47.
  - b. Failed rotational sensor.
  - c. Broken wire or connection between rotation sensor and microprocessor controller (computer).

**S. Microprocessor controller (computer) L.E.D. display reads “Hot”...**

1. Possible overheating condition...microprocessor controller (computer) has sensed a temperature which has exceeded 220° F.

“Hot” display will not clear until temperature sensed has dropped to 220° F or lower and the microprocessor controller (computer) is manually reset by pressing the “CLEAR/STOP” key.

- T. Heating unit is not operating (no heat)...no voltage at heating unit (i.e., *Gas Model* - Hot Surface Ignition [HSI] module, *Electric Model* - electric oven contactor, or *Steam Model* - steam damper system pneumatic solenoid) when dryer is first started and both the heat indicator dot and the "HEAT" output L.E.D. is on...**

*GAS MODELS ...*

1. Fault in sail switch circuit ...
  - a. Sail switch is out of adjustment or has failed.
  - b. Sail switch damper is not closing or is fluttering.
    - 1) Lint screen is dirty.
    - 2) Restriction in the exhaust.
    - 3) No exhaust air flow ...
      - a) Failed impellor (fan/blower).
      - b) Fault in blower (impellor/fan) motor circuit (*for Reversing Models ONLY*).
2. Failed burner hi-limit.
3. Failed lint chamber sensor bracket basket (tumbler) hi-limit switch.

*ELECTRIC MODELS ...*

1. Fault in sail switch circuit ...
  - a. Sail switch is out of adjustment or has failed.
  - b. Sail switch damper is not closing or is fluttering.
    - 1) Lint screen is dirty.
    - 2) Restriction in the exhaust.
    - 3) No exhaust air flow ...
      - a) Failed impellor (fan/blower).
      - b) Fault in blower (impellor/fan) motor circuit (*for Reversing Models ONLY*).
2. Failed burner hi-limit.
3. Failed lint chamber sensor bracket basket (tumbler) hi-limit switch.

*STEAM MODELS ...*

1. Fault in lint chamber sensor bracket basket (tumbler) hi-limit.

**U. Heating unit is not operating (no heat)...no voltage at heating unit (i.e., *Gas Model* - Hot Surface Ignition [HSI] module, *Electric Model* - electric oven contactor, or *Steam Model* - steam damper system pneumatic solenoid) when dryer is first started and both the heat indicator dot and the "HEAT" output L.E.D. (light emitting diode) is not on...**

1. Failed microprocessor controller (computer).

**V. Heating unit is not operating (no heat)...no voltage at heating unit (i.e., *Gas Model* - Hot Surface Ignition [HSI] module, *Electric Model* - electric oven contactor, or *Steam Model* - steam damper system 3-way micro valve)...**

*GAS MODELS ...*

1. Fault in hot surface ignition system ...

a. Hot surface ignitor glows but no ignition and HSI module "LOCKS-OUT" ("red" L.E.D. indicator flashes) ...

1) Flame probe assembly is out of adjustment or has failed.

2) Severe air turbulence.

3) Failed HSI module.

4) Failed gas valve.

b. Hot surface ignitor glows, but burner goes off right away ...

1) Flame probe assembly is out of adjustment or has failed.

2) Sail switch is fluttering ...

a) Lint screen is dirty.

b) Restriction in exhaust duct work.

c. Hot surface ignitor does not glow and HSI module "LOCKS-OUT" ("red" L.E.D. indicator flashes) ...

1) Fault in hot surface ignitor wiring...break or loose connection.

2) Failed hot surface ignitor.

3) Failed HSI module.



### *ELECTRIC MODELS ...*

1. Failed oven contactor/coil.
2. Failed electric heating element(s).

### *STEAM MODELS ...*

1. Air Operated System...
  - a. No (external) compressed air (*80 PSI required*) to steam damper solenoid.
  - b. Failed steam damper pneumatic solenoid.
  - c. Steam damper stuck in *closed position*...check for obstruction.
  - d. Leak in pneumatic system.
  - e. Failed steam damper air piston.
  - f. Flow control valve misadjusted.
2. Electrical Mechanical System...
  - a. Failed electrical mechanical motor.
  - b. Steam damper stuck in *closed position*...check for obstruction.

### **W. Dryer operates but is taking too long to dry...**

1. Exhaust duct work run is too long or is undersized...back pressure **cannot** exceed 0.3 inches water column (W.C.).
2. Restriction in duct work ...
  - a. Dryer back draft damper is sticking partially closed.
  - b. Restriction/obstruction in duct work ...
    - 1) Check duct work from the dryer all the way to the outdoors.
3. Insufficient make-up air.
4. Impellor (fan/blower) is rotating in the wrong direction only (*for 3 $\phi$  Models ONLY*).
5. Lint screen is dirty or is not being cleaned often enough.
6. Inadequate air flow ...
  - a. Impellor (fan/blower) failure.

## *GAS MODELS ...*

- 1) Low and/or inconsistent gas pressure.

Natural Gas pressure - **must be** between 3.5 and 4.0 inches of water column (W.C.).

L.P. (liquid propane) Gas pressure - **must be** between 10.5 and 11.0 inches of water column (W.C.).

- 2) Poor air/gas mixture at burner (too much gas or not enough air) at the burner...yellow or poor flame pattern ...

- a. Not enough make-up air.

- b. Restriction in the exhaust.

- 2) Poor air/gas mixture at burner (too much gas or not enough air) at the burner...yellow or poor flame pattern ...

- c. Gas pressure too high.

- d. Impellor (fan/blower) is rotating in the wrong direction only (*for 3 $\phi$  Models ONLY*).

- e. Burner orifice size (D.M.S. [drill material size]) too large for application (i.e., high elevation).

- 3) Sail switch is fluttering ...

- a) Restriction in the exhaust ...

- (1) Lint screen is dirty or is not being cleaned often enough.

- 4) Failed burner hi-limit...opens at incorrect temperature.

- 5) Gas supply may have too low a heating value.

## *ELECTRIC MODELS ...*

- 1) No enough make-up air.

- 2) Restriction in the exhaust ...

- 3) Lint screen is dirty or is not being cleaned often enough.

- 4) Impellor (fan/blower) is rotating in the wrong direction only (*for 3 $\phi$  Models ONLY*).

- 5) Failed electric element(s).

- 6) Sail switch is fluttering ...

- a) Restriction in the exhaust.

- b) Sail switch is not adjusted properly.

*STEAM MODELS ...*

- 1) Low steam supply.
  - a) Steam trap is too small.
  - b) Supply line is too small.
- 2) Low steam pressure.
- 3) Insufficient make-up air.
- 4) Lint screen is dirty or is not being cleaned often enough.
- 5) Restriction in the exhaust.
- 6) Dirty steam coil ...
  - a) Fins are clogged with lint.
- 7) Steam damper system is not functioning properly.
  - a) Steam damper is sticking closed.
  - b) Leak in the pneumatic (air) system.
7. Extractors (water) are not functioning properly.
8. Failed microprocessor controller (computer)...temperature calibration is inaccurate.
9. Failed microprocessor temperature sensor... calibration is inaccurate.
10. Failed lint chamber hi-heat switch (thermostat)...opens at incorrect temperature.
11. Microprocessor temperature sensor covered with lint.

<p><b>NOTE:</b> Lint accumulation on the sensor bracket can act as an insulator which will affect the accuracy of the Automatic Drying Cycle.</p>
---

**X. At the completion of the "AUTO" drying/cooling cycle, the load is coming out over dried...**

1. Percent of dryness (dryness level) of the cycle selected is too high.
2. Factor "A" and Factor "B" is not set correctly or Factor "B" has to be adjusted for adverse local conditions.

**Y. At the completion of the "AUTO" drying/cooling cycle, the load is coming out still damp...**

1. Percent of dryness (dryness level) of the cycle selected is too high.

2. Factor "A" and Factor "B" is not set correctly or Factor "B" has to be adjusted for adverse local conditions.

**Z. Main burners are burning with a yellow flame (*for Gas Models ONLY*)...**

1. Poor air/gas mixture (too much gas or not enough air) at the burner ...
  - a. Not enough make-up air.
  - b. Restriction in the exhaust.
  - c. Gas pressure is too high.
  - d. Impellor (fan/blower) is rotating in the wrong direction only (*for 3 $\phi$  Models ONLY*).
  - e. Burner orifice size (D.M.S. [drill material size]) too large for application (i.e., high elevation).

**AA. Condensation on main door glass...**

1. Too long, undersized, or improperly installed duct work.
2. Back draft damper is sticking in the partially closed position.

**BB. Scraping noise at basket (tumbler) area...**

1. Check for obstruction caught in basket (tumbler)/wrapper area.
2. Basket (tumbler) is out of proper alignment ...
  - a. Check both the vertical alignment and lateral alignment.
  - b. Check for gap between the front panel and basket (tumbler)...bearing set screws may have come loose, and basket (tumbler) walked forward or backward.
3. Loose basket (tumbler) tie rod.
4. Failed basket (tumbler) support.

**CC. Excessive noise and/or vibration...**

1. Dryer is not leveled properly.
2. Impellor (fan/blower) out of balance ...
  - a. Excessive lint build up on impellor (fan/blower).
  - b. Failed impellor (fan/blower).
3. Loose basket (tumbler) tie rod.
4. Failed basket (tumbler) support.

5. Loose motor mount.
6. Failed idler bearings or basket (tumbler) bearings.
7. V-belts too tight or too loose.
8. Tumbler bearing set screws are loose.
9. Failed motor bearing.

### ***TIMER MODELS***

**A. Dryer will not start...both drive motor and blower (impellor/fan) motor are not operating and indicator light is off...**

1. Service panel fuse blown or tripped breaker.
2. Dryer control circuit L1 or L2 1/2-amp (slo blo) fuse is blown.
3. Open in main door switch ...
  - a. Main door is not closed all the way.
  - b. Main door switch is out of proper adjustment.
  - c. Failed main door switch.
  - d. Broken connection/wire somewhere in the main door switch circuit.
4. Failed push-to-start relay.
5. Failed 24 VAC step down transformer or a fault in the wiring.
6. Failed heat timer.
7. Failed control step down transformer (*for 380 volts or higher models ONLY*).

**B. Drive motor is not operating (does not start)...**

1. Failed drive motor contactor (relay).
2. Failed reversing timer (*for Reversing Models ONLY*).
3. Failed drive motor.

**C. Drive motor (*Reversing Models ONLY*) operates in one direction only ... stops and restarts in the same direction...**

1. Failed reversing contactor (relay).
2. Failed reversing timer.

**D. Drive motor operates okay for a few minutes, then stops and will not restart...**

1. Motor is overheating and tripping out on internal overload protector ...
  - a. Motor air vents clogged with lint.
  - b. Low voltage to motor.
  - c. Failed motor.
  - d. Tumbler (basket) is binding...check for an obstruction.
  - e. Failed idler bearings or tumbler bearings.

**E. Blower/Fan motor is not operating (does not start)...**

1. Failed blower (impellor/fan) motor contactor (relay).
2. Failed blower (fan/impellor) motor.

**F. Blower/Fan motor operates okay for a few minutes, then stops and will not restart...**

1. Motor is overheating and tripping out on internal overload protector ...
  - a. Motor air vents clogged with lint.
  - b. Low voltage to motor.
  - c. Failed motor.
  - d. Failed blower (impellor/fan)...out of balance.

**G. Both drive motor and blower (impellor/fan) motor (*Reversing Models ONLY*) not operating (do not start) and indicator light is on...**

1. Fault at L1 or L2 termination(s) between the terminal block and contactors (relays).
2. Failed contactors (both blower [fan/impellor] and drive ).
3. Failed motors (both blower [fan/impellor] motor and drive motor).

**H. Heating unit is not operating (no heat)...no voltage at heating unit (i.e., *Gas Model* - Hot Surface Ignition [HSI] module, *Electric Model* - electric oven contactor, or *Steam Model* - steam damper system pneumatic solenoid) when dryer is first started...**

*GAS MODELS ...*

1. Fault in sail switch circuit ...
  - a. Sail switch is out of adjustment or has failed.

- b. Sail switch damper is not closing or is fluttering.
  - 1) Lint screen is dirty.
  - 2) Restriction in the exhaust.
  - 3) No exhaust air flow ...
    - a) Failed impellor (fan/blower).
    - b) Fault in blower (impellor/fan) motor circuit (*for Reversing Models ONLY*).
- 2. Failed burner hi-limit.
- 3. Failed lint chamber sensor bracket basket (tumbler) hi-limit switch.

#### *ELECTRIC MODELS ...*

- 1. Fault in sail switch circuit ...
  - a. Sail switch is out of adjustment or has failed.
  - b. Sail switch damper is not closing or is fluttering.
    - 1) Lint screen is dirty.
    - 2) Restriction in the exhaust.
    - 3) No exhaust air flow ...
      - a) Failed impellor (fan/blower).
      - b) Fault in blower (impellor/fan) motor circuit.
  - c. Failed oven hi-limit.
  - d. Failed lint chamber sensor bracket basket (tumbler) hi-limit.
  - e. Failed temperature selection switch or circuit.
  - f. Failed temperature cycle thermostat (try another selection).

#### *STEAM MODELS ...*

- 1. Failed lint chamber sensor bracket hi-limit switch or circuit.
- 2. Failed temperature selection switch or circuit.
- 3. Failed temperature cycle thermostat (try another selection).
- 4. Failed heat timer.

**I. No heat)...no voltage at heating unit (i.e., *Gas Model* - Hot Surface Ignition [HSI] module, *Electric Model* - electric oven contactor, or *Steam Model* - steam damper system pneumatic solenoid)...**

*GAS MODELS ...*

1. Fault in hot surface ignition system ...

a. Hot surface ignitor glows but no ignition and HSI module "LOCKS-OUT" ("red" L.E.D. [light emitting diode] indicator flashes) ...

1) Flame probe assembly is out of adjustment or has failed.

2) Severe air turbulence.

3) Failed HSI module.

4) Failed gas valve.

b. Hot surface ignitor glows, but burner goes off right away ...

1) Flame probe assembly is out of adjustment or has failed.

2) Sail switch is fluttering ...

a) Lint screen is dirty.

b) Restriction in exhaust duct work.

c. Hot surface ignitor does not glow and HSI module "LOCKS-OUT" ("red" L.E.D. indicator flashes) ...

1) Fault in hot surface ignitor wiring...break or loose connection.

2) Failed hot surface ignitor.

3) Failed HSI module.

*ELECTRIC MODELS ...*

1. Failed oven contactor/coil.

2. Failed electric heating element(s).

*STEAM MODELS ...*

1. Air Operated System...

a. No (external) compressed air (*80 PSI required*) to steam damper solenoid.

b. Failed steam damper pneumatic solenoid.



- c. Steam damper stuck in *closed* position...check for obstruction.
  - d. Leak in pneumatic system.
  - e. Failed steam damper air piston.
  - f. Flow control valve misadjusted.
2. Electrical Mechanical System...
- a. Failed electrical mechanical motor.
  - b. Steam damper stuck in *closed* position...check for obstruction.

**J. Dryer operates but is taking too long to dry...**

- 1. Exhaust duct work run is too long or is undersized...back pressure **cannot** exceed 0.3 inches water column (W.C.).
- 2. Restriction in duct work ...
  - a. Dryer back draft damper is sticking partially closed.
  - b. Restriction/obstruction in duct work ...
    - 1) Check duct work from the dryer all the way to the outdoors.
- 3. Insufficient make-up air.
- 4. Impellor (fan/blower) is rotating in the wrong direction only (*for 3 $\phi$  Models ONLY*).
- 5. Lint screen is dirty or is not being cleaned often enough.
- 6. Inadequate air flow ...
  - a. Impellor (fan/blower) failure.

*GAS MODELS ...*

- 1) Low and/or inconsistent gas pressure.
  - Natural Gas pressure - **must be** between 3.5 and 4.0 inches of water column (W.C.).
  - L.P. (liquid propane) Gas pressure - **must be** between 10.5 and 11.0 inches of water column (W.C.).
- 2) Poor air/gas mixture at burner (too much gas or not enough air) at the burner...yellow or poor flame pattern ...
  - a. Not enough make-up air.
  - b. Restriction in the exhaust.

- 3) Sail switch is fluttering ...
  - a) Lint screen is dirty or is not being cleaned often enough.
  - b) Restriction in the exhaust.
- 4) Failed burner hi-limit...opens at incorrect temperature.
- 5) Gas supply may have too low a heating value.

*ELECTRIC MODELS ...*

- 1) No enough make-up air.
- 2) Restriction in the exhaust ...
- 3) Lint screen is dirty or is not being cleaned often enough.
- 4) Impellor (fan/blower) is rotating in the wrong direction only (*for 3 $\phi$  Models ONLY*).
- 5) Failed electric element(s).
- 6) Sail switch is fluttering ...
  - a) Restriction in the exhaust.
  - b) Sail switch is not adjusted properly.

*STEAM MODELS ...*

- 1) Low steam pressure.
- 2) Insufficient make-up air.
- 3) Lint screen is dirty or is not being cleaned often enough.
- 4) Restriction in the exhaust.
- 5) Dirty steam coil ...
  - a) Fins are clogged with lint.
- 6) Steam damper system is not functioning properly.
  - a) Steam damper is sticking closed.
  - b) Leak in the pneumatic (air) system.
7. Extractors (water) are not functioning properly.
8. Failed lint chamber hi-heat switch (thermostat)...opens at incorrect temperature.

9. Exceptionally cold/humid or low barometric pressure atmosphere.
10. Cycle temperature thermostats are covered with lint

**NOTE:** Lint accumulation on the sensor bracket can act as an insulator which will affect the accuracy of the Automatic Drying Cycle.

**K. Main burners are burning with a yellow flame (*for Gas Models ONLY*)...**

1. Poor air/gas mixture (too much gas or not enough air) at the burner ...
  - a. Not enough make-up air.
  - b. Restriction in the exhaust.
  - c. Gas pressure is too high.
  - d. Impellor (fan/blower) is rotating in the wrong direction only (*for 3 $\phi$  Models ONLY*).
  - e. Burner orifice size (D.M.S. [drill material size]) too large for application (i.e., high elevation).

**L. Condensation on main door glass...**

1. Too long, undersized, or improperly installed duct work.
2. Back draft damper is sticking in the partially closed position.

**M. Scraping noise at basket (tumbler) area...**

1. Check for obstruction caught in basket (tumbler)/wrapper area.
2. Basket (tumbler) is out of proper alignment ...
  - a. Check both the vertical alignment and lateral alignment.
  - b. Check for gap between the front panel and basket (tumbler)...bearing set screws may have come loose, and basket (tumbler) walked forward or backward.
3. Loose basket (tumbler) tie rod.
4. Failed basket (tumbler) support.

**N. Excessive noise and/or vibration...**

1. Dryer is not leveled properly.
2. Impellor (fan/blower) out of balance ...
  - a. Excessive lint build up on impellor (fan/blower).
  - b. Failed impellor (fan/blower).

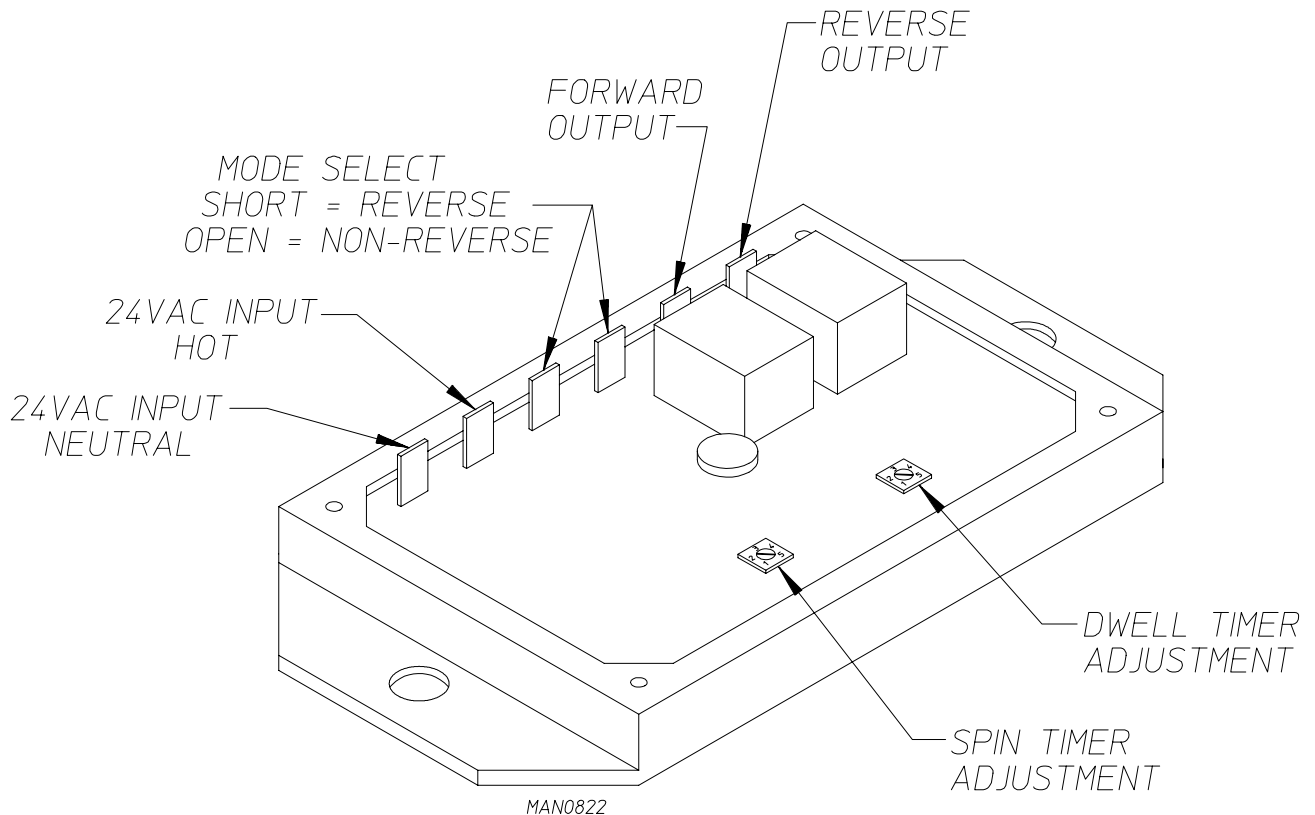
3. Loose basket (tumbler) tie rod.
4. Basket (tumbler) out of adjustment, or adjustment bolts (hardware) are loose.
5. Failed basket (tumbler) support.
6. Loose motor mount.
7. Failed idler, basket (tumbler), or blower drive bearings.
8. V-belts too tight or too loose.
9. Bearing set screws (either basket [tumbler], idler, or blower shaft) are loose.
10. Failed motor bearing.

# SECTION VIII

## REVERSING TIMER SPIN/DWELL ADJUSTMENTS

Timer models have an electronic reversing timer in the electrical service box which is located in the upper left rear area of the dryer.

Both the Dwell (stop) Time and the basket (tumbler) Spin Time are adjustable by mode selection switches located on the electronic timer (as noted in the illustration below)

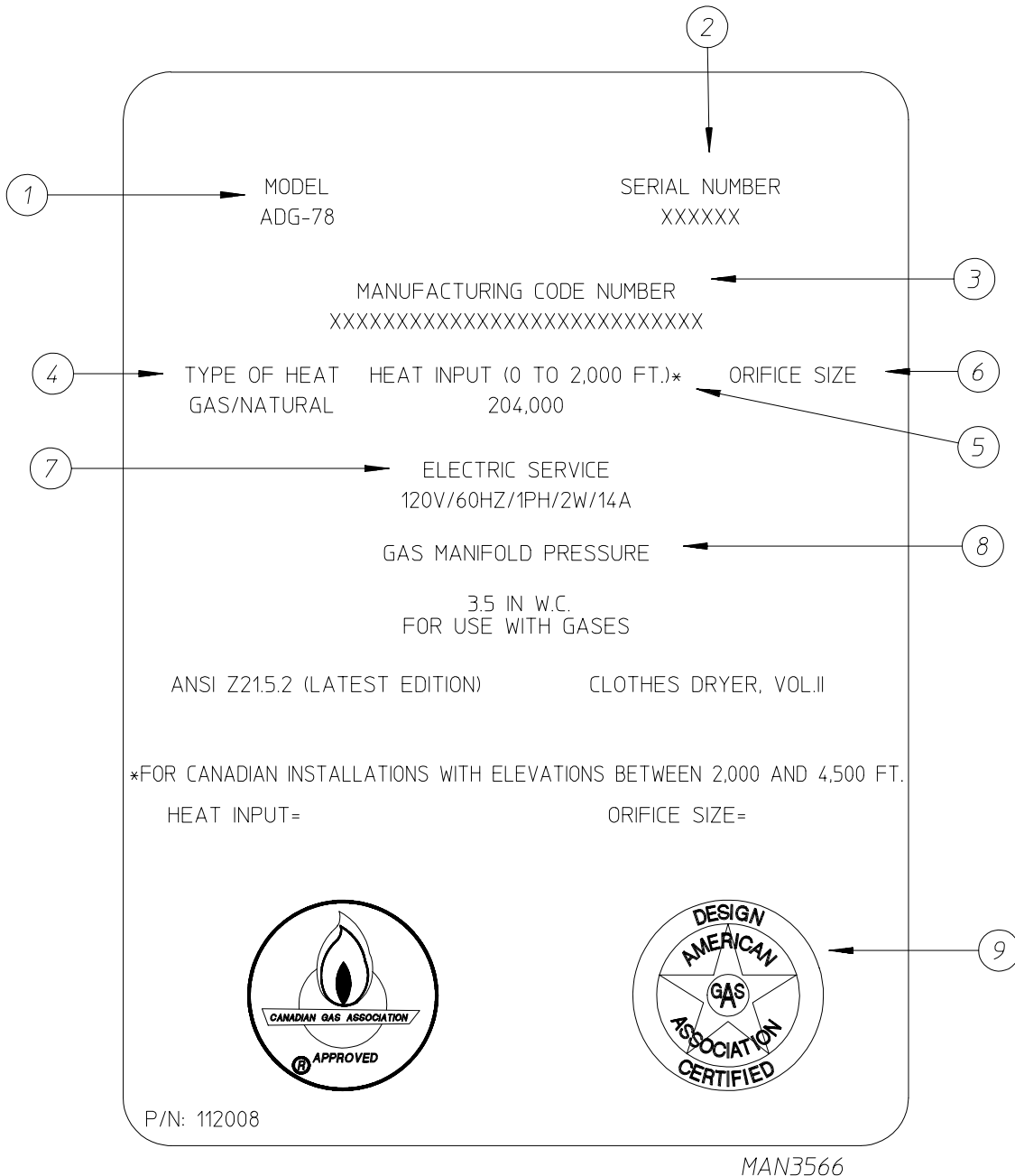


<b>TIMING LEGEND</b>					
<b>SPIN TIME</b>					
Switch Postion Number	1	2	3	4	5
Time in Seconds*	30	60	90	120	150
<b>DWELL (Stop) TIME</b>					
Switch Postion Number	1	2	3	4	5
Time in Seconds*	5	6	8	10	12
* Values shown are +/- 1 second.					

# SECTION IX

## DATA LABEL LOCATION/INFORMATION

### DATA LABEL



When contacting **American Dryer Corporation**, certain information is required to insure proper service/parts information from **ADC**. This information is on the data label that is located in the left inside front side panel (as shown in the illustration above). When contacting **ADC** please have the **model number** as well as the **serial number** readily available.

## **THE DATA LABEL**

### **1. MODEL DRYER**

The model number is an **ADC** number which describes the size of the dryer and the type of heat (gas, electric, or steam).

### **2. SERIAL NUMBER**

The serial number allows **ADC** to gather information on your particular dryer.

### **3. MANUFACTURING CODE NUMBER**

The manufacturing code number is a number issued by **ADC** which describes **ALL** possible options on your particular model.

### **4. TYPE OF HEAT**

The type of heat describes the type heat for your particular dryer; gas (either natural gas or liquid propane [L.P.]), or steam.

### **5. HEAT INPUT (for GAS DRYERS)**

This describes the heat input in British Thermal Units per Hour (BTUH).

### **6. ORIFICE SIZE (for GAS DRYERS)**

Gives the number drill size used.

### **7. ELECTRIC SERVICE**

This describes the electric service for your particular model.

### **8. GAS MANIFOLD PRESSURE (for GAS DRYERS)**

This describes the manifold pressure taken at the gas valve tap.

### **9. APPLICABLE APPROVAL SEAL(S)**

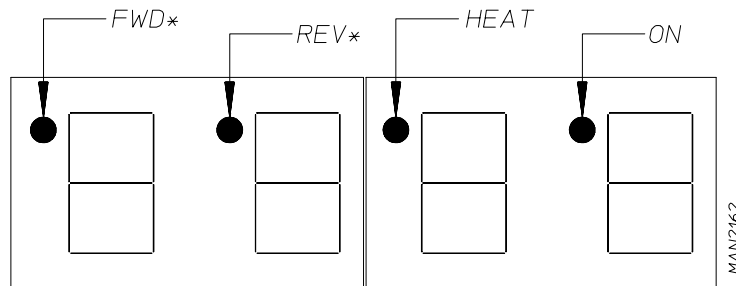
I.E., American Gas Association, Canadian Gas Association.

# SECTION X

## PROCEDURE FOR FUNCTIONAL CHECK OF REPLACEMENT COMPONENTS

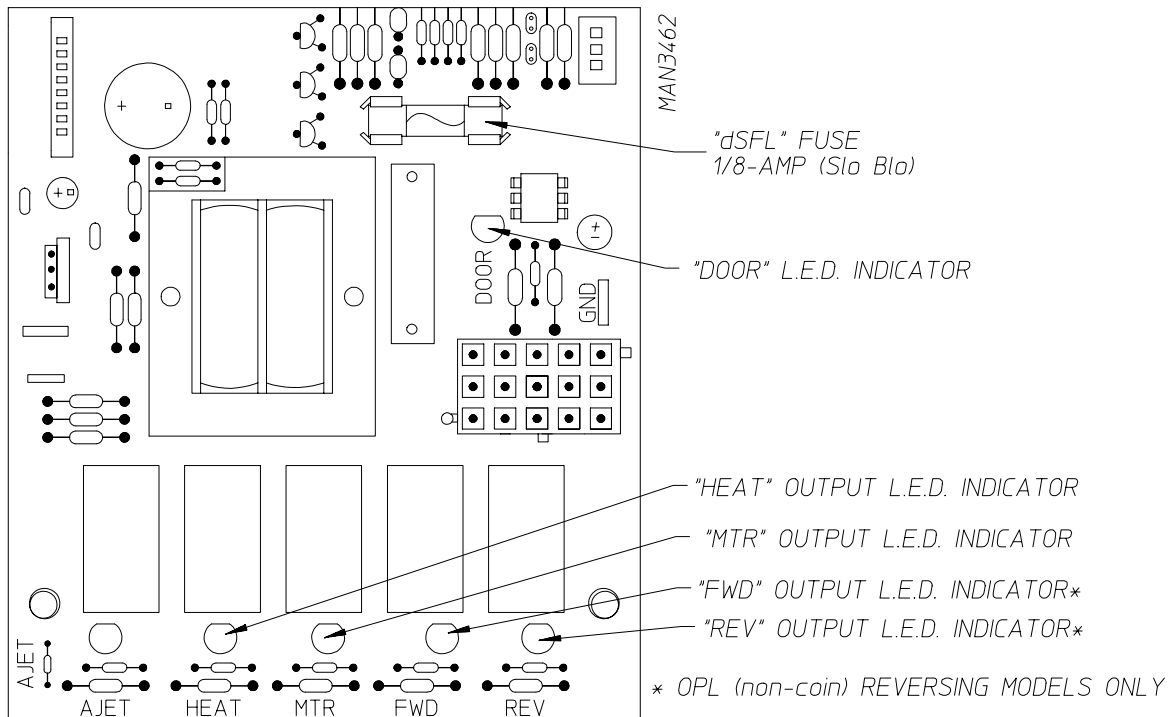
### 1. Microprocessor (computer) Board

- a. Upon completing installation of the replacement microprocessor (computer) board, reestablish power to the dryer.
- b. Start the drying cycle.
- c. Verify that the motor(s) and the heat indicator dots, in the microprocessor (computer) L.E.D. display are on. (Refer to the illustration below.)



\*OPL (NON-COIN) REVERSING MODELS ONLY.

- d. Verify that the motor(s) heat, and door indicator lights on the back side of the microprocessor (computer) board are lit. (Refer to the illustration below.)



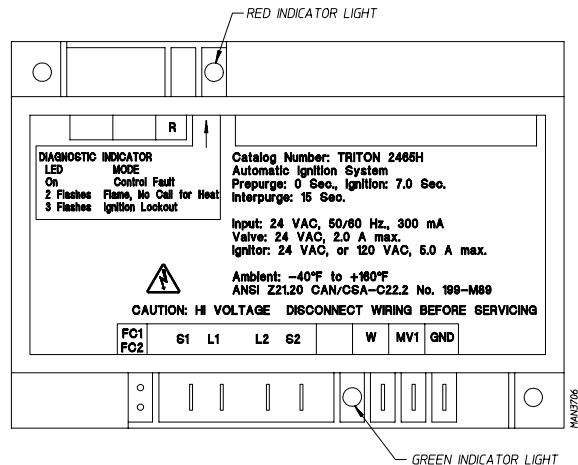


- e. Open main door. The dryer **must stop** and **ALL** indicator lights on the back side of the microprocessor (computer) board **must go out**. (Refer to **illustration** on the previous page [[page 68](#)].)
- f. Try to restart the dryer with the main door open.
- g. The microprocessor (computer) board's L.E.D. display **must read "DOOR."**
- h. Close the main door and restart the dryer.
- i. Functional check of microprocessor (computer) board is complete.

2. Hot Surface Ignition (HSI) System

- a. Upon completing installation of the replacement Hot Surface Ignition (HSI) module, reestablish power to the dryer.
- b. Start the drying cycle.
- c. The HSI module's "red" indicator light will light for up to approximately 5 seconds (self check routine).

If the HSI module's "red" indicator light stays on or flashes continuously, then the HSI module is wired incorrectly or has failed.



- d. The green indicator will light then the hot surface ignitor will turn on, and a few seconds later the gas valve will be energized. After approximately 4 seconds the hot surface ignitor will shut off. **Ignition (flame) should now be established.**
- e. With the burner flame on, remove the flame sensor wire from the S2 terminal of the HSI module. **The burner flame must shut off immediately.**
- f. Stop the drying cycle, with the flame sensor wire still removed, restart the drying cycle.
- g. The hot surface ignitor will turn on, and after a few seconds later the gas valve will be energized and the hot surface ignitor will shut off. Ignition (flame) **should be** evident for approximately 7 seconds and then shut off.
- h. The HSI module will attempt two (2) additional ignition trials after which the HSI module will lock out and the "red" indicator light **will flash continuously**.
- i. Functional check of the Hot Surface Ignition (HSI) Module is complete.

1) Replace the flame sensor wire from the S2 terminal to the HSI module.

ADC 113028 1- 01/09/98-30 2\* 08/17/98-30

