

# INSTRUCTION MANUAL

**MODEL  
DE100**






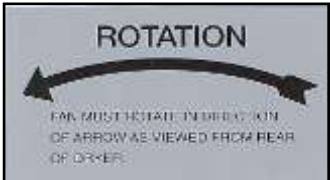

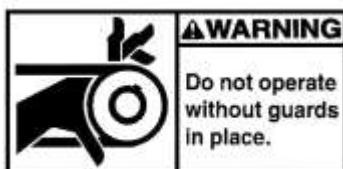
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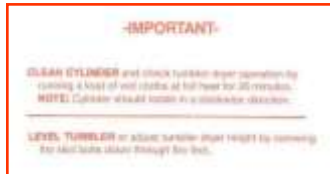

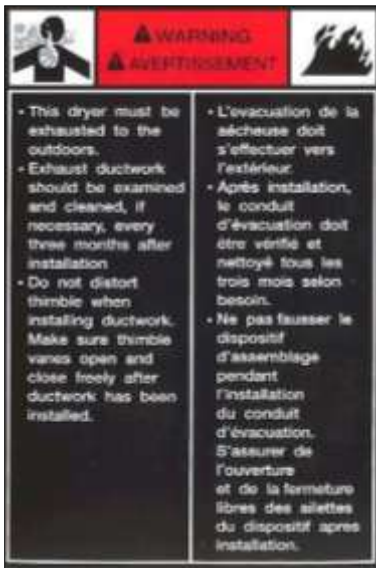
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# KEY SYMBOLS

Anyone operating or servicing this machine must follow the safety rules in this manual. Particular attention must be paid to the **DANGER**, and **WARNING**, and **CAUTION** blocks which appear throughout the manual.

Symbols	Description
	This warning symbol indicated the presence of hot surfaces that could cause serious burns. Stainless steel and steam lines can become extremely hot and <b>should not be</b> touched.
	<b>IMPORTANT!</b> Keep lint compartment clean
	<b>WARNING!</b> Dry only water washed fabrics. <b>Do not</b> use heat for drying foam rubber or similar textured rubber like materials.
	<b>Information</b> Alert to the correct direction of rotation.
	<b>DANGER!</b> High voltage present.
	<b>DANGER!</b> For the hand, Belts and pulley in motion. Do Not operate with out Guard.

Symbols	Description
	<p><b>WARNING!</b> Put DRYCLEANED Laundry into this dryer</p>
	<p><b>Information</b> The machine is use 24 VAC. for control.</p>
	<p><b>IMPORTANT!</b> Clean cylinder and check tumbler dryer operation by running a load of wet cloths at full heat for 20 minutes.</p>
	<p><b>WARNING!</b> To reduce the risk of electric shock, disconnect electric power before servicing</p>
	<p><b>WARNING!</b> This dryer must be exhausted to the outdoors. Exhaust ductwork <b>should be</b> examined and cleaned, if necessary, every three months after installation. <b><u>Do not</u></b> distort thimble when installing ductwork. Make sure thimble vanes open and close freely after ductwork has been installed.</p>

## **SECTION 1**

### **IMPORTANT INFORMATION**

#### **A. RECEIVING AND HANDLING**

The dryer is shipped in a protective stretch wrap cover with protective cardboard comers and top cover (or optional box) as a means of preventing damage in transit. Upon delivery, the dryer and / or protective 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 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. Dryers / 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.

#### **Dryer assumes no responsibility for freight claims or damages.**

6. If you need assistance in handling the situation, please contact the Dryer traffic manager

**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.

## IMPORTANT INFORMATION

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### 3. What To Do If You Smell Gas:

- a. **DO NOT** tries to light any appliance.
  - b. **DO NOT** touches any electrical switch.
  - c. **DO NOT** uses 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 the gas supplier.
  5. Dryer(s) **must be** exhausted to the outdoors.
  6. Although dryer produces a very versatile machine, there are some articles that, due to fabric compositional 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 solvents will create a fire hazard.

**WARNING:** **DO NOT** use heat for drying articles that contain plastic, foam, sponge rubber, or similarly textured rubber – like 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 the 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, or in Canada, the Canadian Electrical Codes Parts 1 & 2 CSA C22.1 – 1990 or LATEST EDITION.

**NOTE:** Failure to do so will. **VOID THE WARRANTY.**

9. Under no circumstances should the dryer door switch, lint drawer switch or heat circuit safety devices 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.

## **IMPORTANT INFORMATION**

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

12. **DO NOT** operates steam dryers with more than 125 Psi steam pressure. Excessive steam pressure can damage steam coil and / or harm personnel.
13. Replace leaking flexible steam hoses or other steam fixtures immediately. **DO NOT** operate dryer with leaking flexible hoses. **PERSONAL INJURY MAY RESULT.**
14. Read and follow all caution and direction label attached to Dryer.

**IMPORTANT:** You must disconnect and lockout the electric supply and the gas supply or the steam supply before any covers or guards are remove from the machine to allow access to cleaning, adjusting, installation, or testing of any equipment per **OSHA (Occupational Safety and Health Administration) STANDARDS.**

### **C. IN CASE OF DETERIORATION PRODUCTS**

1. The defective products or parts can be sold to increase the financial value.
2. The defective products able to separate into parts and bring the materials which can convert into new functional products.
3. The defective products can be reused by repairing and making the products is in good condition.

## **SECTION 2**

### **SPECIFICATIONS / COMPONENT IDENTIFICATION**

#### **A. TECHNICAL SPECIFICATIONS**

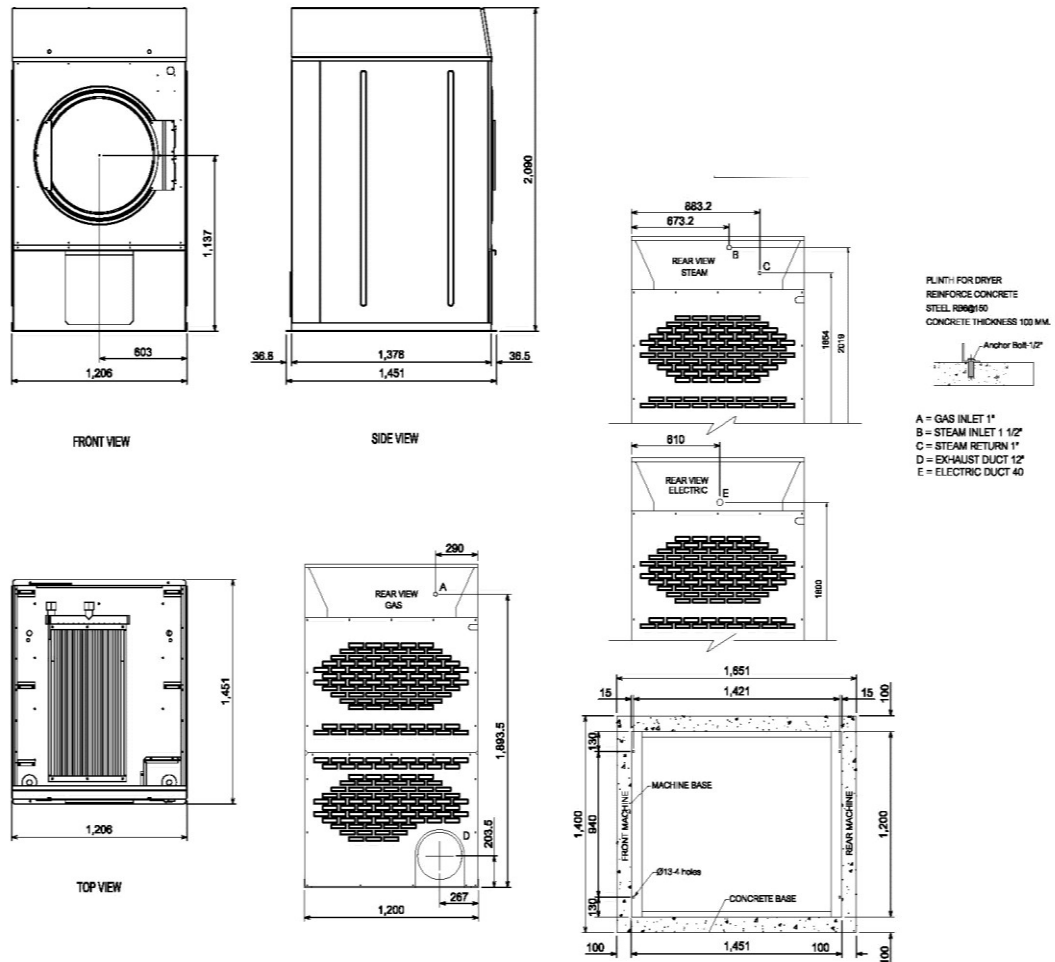
Model			30 lbs.	50 lbs.	75 lbs.	100 lbs.	120 lbs.
Units of Measurement	Metric	US					
Maximum capacity (dry weight)	kg.	lbs.	13.6 (30)	22.7(50)	34(75)	45.4(100)	54.4(120)
Basket Diameter	mm.	inch	762(30")	922(36.3")	922(36.3")	1130(44.5")	1130(44.5")
Basket Depth	mm.	inch	762(30")	762(30")	910(35.8")	867(32.4")	1076(42.4")
Basket Volume	cu.m	cu.ft	0.35(12.4)	0.51(18)	0.61(21.5)	0.78(30.7)	1.08(38.1)
Basket Motor	kW	HP	0.373(0.5)	0.75(1)	0.75(1)	0.75(1)	0.75(1)
Blower Motor	kW.	HP	0.373(0.5)	0.75(1)	0.75(1)	2.24(3)	2.24(3)
<b>OVERALL DIMENSIONS :</b>							
A – Machine Width	mm.	inch	805(31.7")	980(38.6")	980(38.6")	1200(47.2")	1200(47.2")
B – Machine Depth	mm.	inch	1140(44.9")	1150(45.3")	1270(50")	1460(57.5")	1660(65.4")
C – Machine Height at full							
-Gas Model	mm.	inch	1840(72.4")	1920(75.6")	1920(75.6")	2205(86.8")	2205(86.8")
-Steam Model	mm.	inch	1999(78.7")	2040(80.3")	2040(80.3")	2318(91.3")	2318(91.3")
-Electric Model	mm.	inch	1860(73.2")	1920(75.6")	2002(78.8")	2104(82.8")	2104(82.8")
<b>GAS MODEL :</b>							
Air Flow	cmm	cfm	17(600)	21.25(750)	25.5(900)	62.3(2200)	62.3(2200)
Gas Consumption	kcal/hr	btu/hr	22680(90000)	32760(130000)	50400(200000)	94500(375000)	94500(375000)
Gas Inlet Connection	NPT		1/2"	1/2"	3/4"	1"	1"
Exhaust Duct Connection	mm.	inch	203(8")	203(8")	203(8")	305(12")	305(12")
Net Weight (approx.)	kg.	lbs.	294(648.2)	348(767.2)	379(835.5)	596 (1254.4)	682(1503.6)
Shipping Weight (approx.)	kg.	lbs.	304(670.2)	358(789.3)	390(859.8)	616(1358.0)	702(1547.6)
<b>STEAM MODEL :</b>							
Air Flow	cmm	cfm	17(600)	21.25(750)	25.48(900)	77.9(2750)	77.9(2750)
Steam Consumption	kg/hr	lb/hr	40.69(89.7)	71.99(158.7)	101.125(224.25)	203.45(448.5)	203.45(448.5)
Steam Supply Connection	NPT		3/4"	3/4"	3/4"	1-1/4"	1-1/4"
Steam Return Connection			1/2"	1/2"	1/2"	1/2"	1/2"
Exhaust Duct Connection	mm.	inch	203(8")	203(8")	203(8")	305(12")	305(12")
Steam Pressure	bar	psi	5.6-8.79(80-125)	5.6-8.79(80-125)	5.6-8.79(80-125)	5.6-8.79(80-125)	5.6-8.79(80-125)
Air Pressure	bar	psi	N/a	N/a	N/a	N/a	6-8(87-116)
Net Weight (approx.)	kg.	lbs.	307(676.9)	362(798)	385(848.8)	609(1342.6)	731(1611.6)
Shipping Weight (approx.)	kg.	lbs.	315(694.5)	372(820.1)	396(873.0)	629(1386.7)	751(1655.7)
<b>ELECTRIC MODEL :</b>							
Air Flow	cmm	cfm	17(600)	21.25(750)	25.48(900)	77.9(2750)	77.9(2750)
Electric Consumption	kW		24	24	36	72	72
Exhaust Duct Connection	mm.	inch	203(8")	203(8")	203(8")	305(12")	305(12")
Net Weight (approx.)	kg.	lbs.	308(679)	354(780.4)	382(842.2)	558(1230.2)	702(1547.6)
Shipping Weight (approx.)	kg.	lbs.	317(698.9)	364(802.5)	393(866.4)	578(1274.3)	722(1591.7)
<b>THERMAL OIL MODEL :</b>							
Air Flow	cmm	cfm	17(600)	21.25(750)	25.48(900)	77.9(2750)	77.9(2750)
Thermal Oil Consumption	kg/hr	lb/hr	3837.6	6724.8	6724.8	20548.8	20548.8
Thermal Oil Supply Connection	NPT		1/2"	1 1/2"	1 1/2"	2 1/2"	2 1/2"
Thermal Oil Return Connection			1/2"	1 1/2"	1 1/2"	2 1/2"	2 1/2"
Exhaust Duct Connection	mm.	Inch	203(8")	203(8")	203(8")	305(12")	305(12")
Thermal Oil Pressure	bar	psi	2-4(39-58)	2-4(39-58)	2-4(39-58)	2-4(39-58)	2-4(39-58)
Air Pressure	bar	psi	-	-	-	6-8(87-116)	6-8(87-116)
Net Weight (approx.)	kg.	lbs.	324(714.3)	460(1014.1)	460(1014.1)	N/A	865(1906.9)
Shipping Weight (approx.)	kg.	lbs.	335(738.5)	475(1047.1)	475(1047.1)	N/A	885(1951)



## SPECIFICATIONS / COMPONENT IDENTIFICATION

Model			150 lbs.	170 lbs.	190 lbs.	200 lbs.
Units of Measurement	Metric					
Maximum capacity (dry weight)	kg.	lbs.	67.9(150)	77.1(170)	86(190)	90 (200)
Basket Diameter	mm.	inch	1308(51.5")	1308(44.5")	1308(51.38")	1500(59")
Basket Depth	mm.	inch	960(37.8")	1080(42.5")	1270(50")	1190(46.85")
Basket Volume	cu.m	cu.ft	1.29(45.6)	1.45(51.2)	1.71(60.4)	2.1(74.16)
Basket Motor	kW	HP	1.5(2)	1.5(2)	2.24(3)	2.24(3)
Blower Motor	kW.	HP	5.5(7.5)	5.5(7.5)	5.5(7.5)	5.5(7.5)
<b>OVERALL DIMENSIONS :</b>						
A – Machine Width	mm.	inch	1420(55.9")	1420(55.9")	1416(55.7")	1616 (63.6")
B – Machine Depth	mm.	inch	1601(63")	1700(66.9")	1970(77.6")	2027(79.8")
C – Machine Height at full						
-Gas Model	mm.	inch	2530(99.6")	2530(99.6")	2530(99.6")	2682(105.6")
-Steam Model	mm.	inch	2573(101.3")	2573(101.3")	2380(93.7")	2528(99.5")
-Electric Model	mm.	inch	2380(93.7")	2380(93.7")	2380(93.7")	2528(99.5")
<b>GAS MODEL :</b>						
Air Flow	cmm	cfm	70.8(2500)	113.27(4000)	113.27(4000)	150(5300)
Gas Consumption	kcal/hr	btu/hr	123480(490000)	138700(550000)	157600(625000)	157600(625000)
Gas Inlet Connection	NPT		1"	1"	1"	1"
Exhaust Duct Connection	mm.	inch	406(16")	406(16")	406(16")	406(16")
Net Weight (approx.)	kg.	lbs.	896(1975.3)	1016(2239.9)	1150(2535.3)	1216(2681)
Shipping Weight (approx.)	kg.	lbs.	922(2028.4)	1046(2306)	1180(2601.5)	1246(2747)
<b>STEAM MODEL :</b>						
Air Flow	cmm	cfm	113.26(4000)	113.26(4000)	184(6500)	184(6500)
Steam Consumption	kg/hr	lb/hr	297.35(655.5)	297.35(655.5)	422.55(931.5)	422.55(931.5)
Steam Supply Connection	NPT		1-1/4"	1-1/4"	2"	2"
Steam Return Connection			3/4"	3/4"	1"	1"
Exhaust Duct Connection	mm.	inch	406(16")	406(16")	406(16")	406(16")
Steam Pressure	bar	psi	5.6-8.79(80-125)	5.6-8.79(80-125)	5.6-8.79(80-125)	5.6-8.79(80-125)
Air Pressure	bar	psi	6-8(87-116)	6-8(87-116)	6-8(87-116)	6-8(87-116)
Net Weight (approx.)	kg.	lbs.	919(2026)	1042(2297.2)	1180(2601.5)	1229(2709.5)
Shipping Weight (approx.)	kg.	lbs.	949(2092.2)	1072(2363.4)	1210(2667.6)	1269(2797.7)
<b>ELECTRIC MODEL :</b>						
Air Flow	cmm	cfm	113.26(4000)	113.26(4000)	184(6500)	184(6500)
Electric Consumption	kW		120	120	120	120
Exhaust Duct Connection	mm.	inch	406(16")	406(16")	406(16")	406(16")
Net Weight (approx.)	kg.	lbs.	905(1995)	1026(2261.9)	N/a	1331(2934.4)
Shipping Weight (approx.)	kg.	lbs.	932(2054)	1056(2328.1)	N/a	1371(3022.5)
<b>THERMAL OIL MODEL :</b>						
Air Flow	Cmm	cfm	113.26(4000)	113.26(4000)	184(6500)	184(6500)
Thermal Oil Consumption	kg/hr	lb/hr	27360	27360	24073.2	24073.2
Thermal Oil Supply Connection	NPT		2"	2"	2"	2"
Thermal Oil Return Connection			2"	2"	2"	2"
Exhaust Duct Connection	mm.	inch	406(16")	406(16")	406(16")	406(16")
Thermal Oil Pressure	bar	psi	2-4(39-58)	2-4(39-58)	2-4(39-58)	2-4(39-58)
Air Pressure	bar	psi	6-8(87-116)	6-8(87-116)	6-8(87-116)	6-8(87-116)
Net Weight (approx.)	kg..	lbs.	N/A	1042(2297)	1398(3082)	N/A
Shipping Weight (approx.)	kg.	lbs.	N/A	1072(2363)	1428(3148.2)	N/A

**B. TECHNICAL DIMENSION**



**Figure.2-1** Dryer Model 100 lb. Technical Dimension

### **SECTION 3**

#### **INSTALLATION PROCEDURES**

Installation **should be** performed by competent technicians in accordance with local and state codes. In the absence of these codes, installation **must conform** to applicable American National Standards: ANSI Z223.1 – LATEST EDITION (National Fuel Code) or ANSI/NFPA No.70 – LATEST EDITION (National Electrical Code) or in Canada, the installation **must conform** to applicable Canadian Standards: CAN/CGA – B149.1 – M91 (Natural Gas) or CAN/CGA – B149.2 – M91 (L.P. Gas) or LATEST EDITION (for General Installation and Gas Plumbing ) or Canadian Electrical Code Parts 1 & 2 CSA C22.1 – 1990 or LATEST EDITION (for Electrical Connections).

##### **A. LOCATION REQUIRMENTS**

Before installing the dryer, be sure the location conforms to local codes and ordinances. In absence of such codes or ordinances location **must conform** with the National Fuel Gas Code ANSI Z223.1 – LATEST EDITION, or in Canada, the Canadian Installation Codes CAN/CGA – B149.1 – M91 (Natural Gas) or CAN/CGA – B149.2 – M91 (L.P. Gas) or LATEST EDITION.

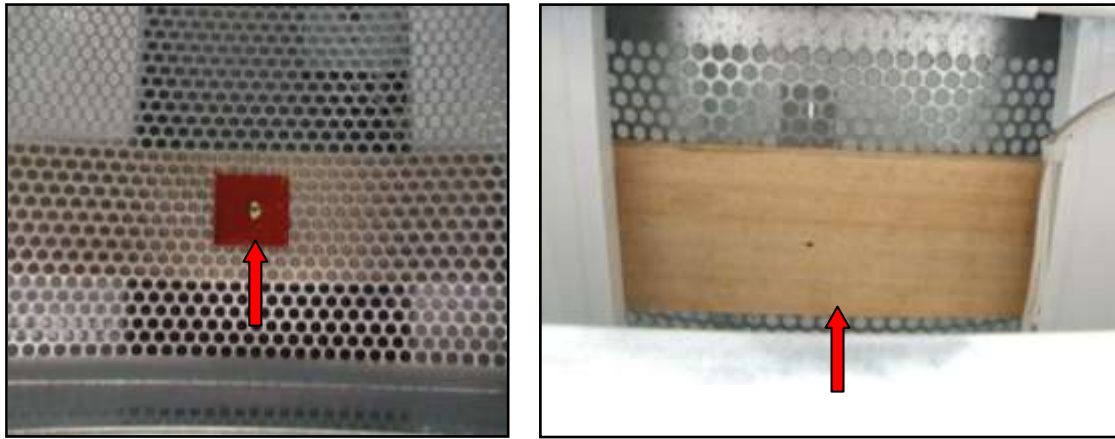
1. The dryer **must be** installed on a sound level floor capable of supporting its weight. It is recommended that carpeting be removed from the floor area that the dryer is to rest on.
2. The dryer **must not be** installed or stored in an area where it will be exposed to water and / or weather.
3. This 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 this 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.

1. Unscrew nut the wood piece before operating the machine.
2. Take out the wood piece before operating the machine.



**Figure.3-1** Protective Shipping Material

**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) lag bolts securing the base of the dryer to the wooden skid. Two (2) are located at the rear base, and two (2) are located in the bottom of the lint chamber. To remove the two (2) lag bolts located in the lint chamber area, remove lint drawer and the three (3) Phillips head screws securing lint door in place.



**Figure.3-2** Dryer Model 100 lb. Rear View

## INSTALLATION PROCEDURES

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### 1. Leveling Dryer

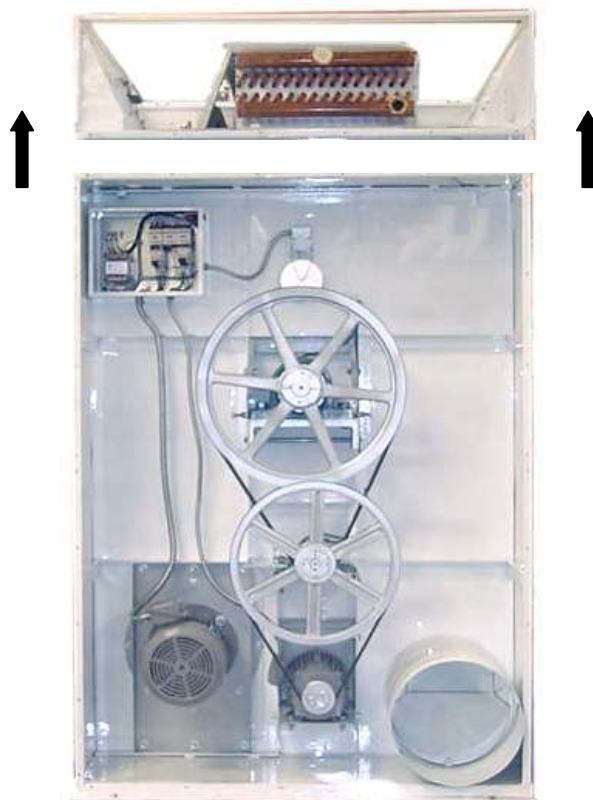
To level dryer, place 4 – inches square metal shims or other suitable material under the base pads. It is suggested that the dryer be tilted slightly to the rear.

### 2. If more headroom is needed when moving dryer into position, the top console (module) may be removed.

#### To remove top console (module)

- 1) Disconnect the ground wire at the Rear Upper Left Hand Cover of Dryer.
- 2) Remove the six (6) set of nuts and washers holding the console (module) to base.
- 3) Open the control door / control panel and disconnect the white 15 – pin plug connector located in the base of the control box.
- 4) Disconnect white plug connector located outside backside of the control box (provides power to heat circuit).
- 5) Lift the console (module) off of the dryer base.

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



**Figure.3-3** Dryer Model 100 lb. Rear View to Remove Top Console (module)

### C. DRYER ENCLOSURE REQUIREMENTS

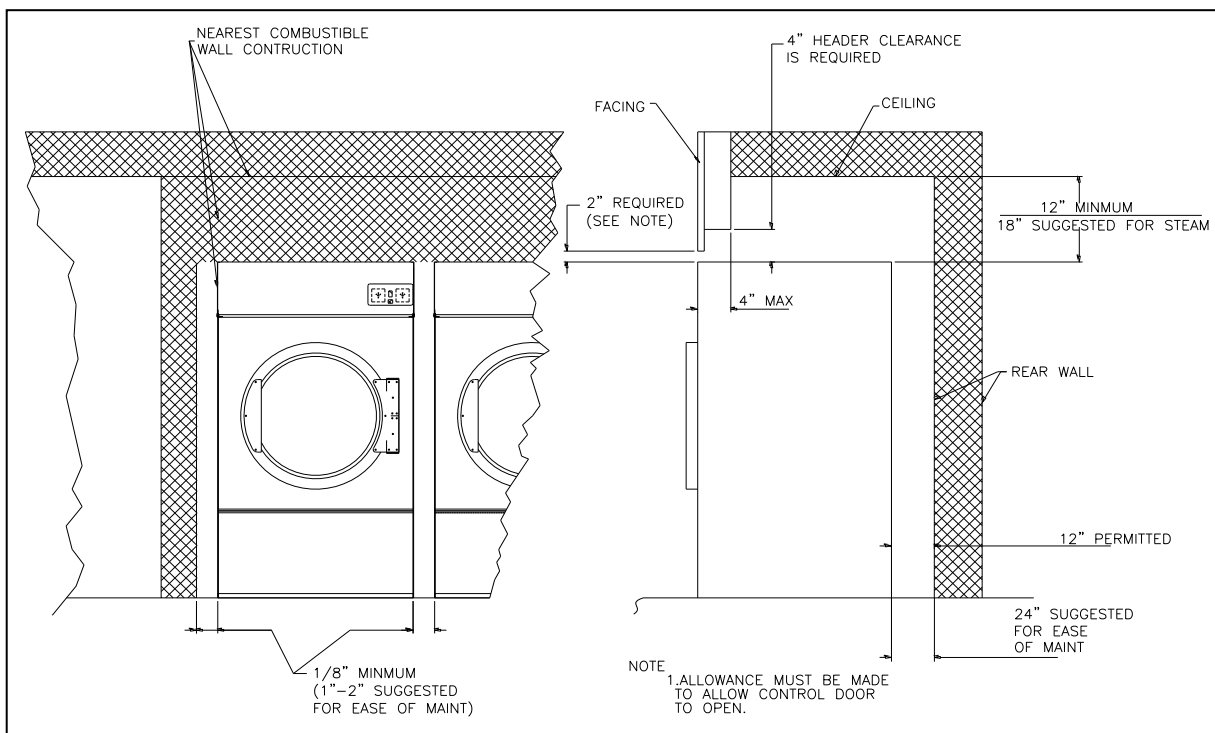
Even though a 12 – inches clearance is acceptable, it is recommended that the rear of the dryer be positioned approximately two (2) feet (24 – inches) from nearest obstruction (i.e., wall) for ease of installation, maintenance, and service. Bulkheads and partitions **should be** made from noncombustible materials.

The clearance between the bulkhead header and the dryer **must be** a minimum of 4 – inches and must not extend more than 4 – inches to the rear of the dryer front. The bulkhead facing must not be closed in all the way to the top of the dryer. A 2 – inches clearance is required.

**NOTE:** Bulkhead facing should not be installed until after dryer is in place. Ceiling area must be located a minimum of 12 – inches above the top of the dryer.

**IMPORTANT:** Even though a minimum of only 12 – inches is required, 18 – inches or more is suggested, for steam dryers and especially in cases where sprinkler heads are over the dryers.

**NOTE:** When fire sprinkler systems are located above the dryers, a minimum of 18 – inches above the dryer console (module) is suggested. Dryers may be positioned side wall to side wall however, 1 or 2 – inches is suggested between dryers or wall) for ease of installation and maintenance. Allowances must be made for the opening and closing of the control and lint doors.



**Figure.3-4** Dryer Clearance to Adjacent Wall Structures

### 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.

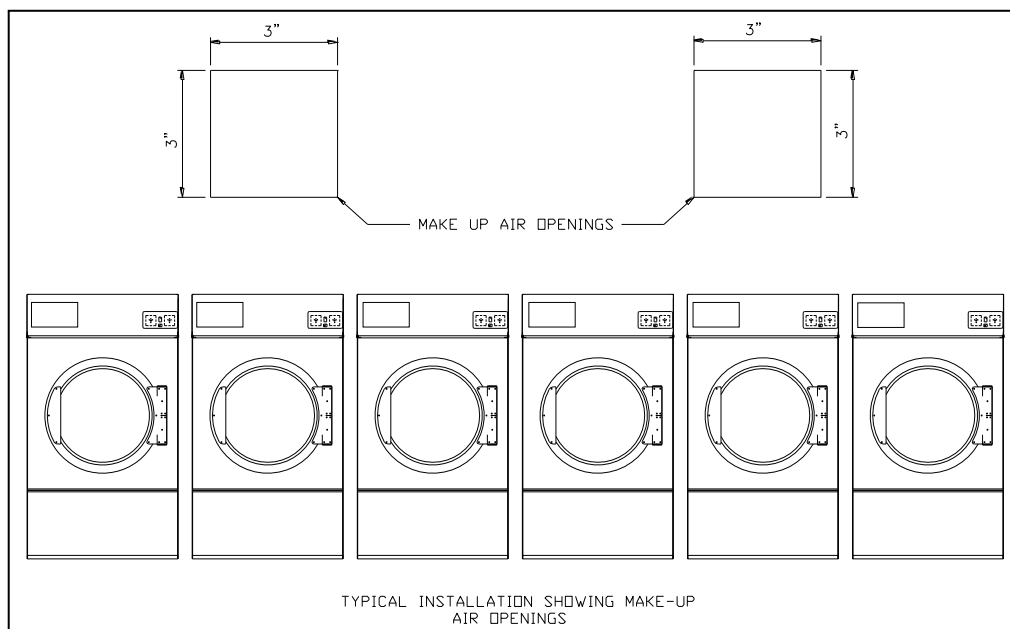
Air supply (make – up air) **must be** given careful consideration to assure proper performance of each dryer. An unrestricted source of air is necessary for each dryer. An air flow of 2,150 cfm (cubic feet per minute) must be supplied to each gas dryer and electric dryer with a 72 Kw oven, 2,500 cfm to each electric dryer with an 80 Kw oven, and 2,750 cfm for each steam dryer. As a general rule, an unrestricted air entrance from the outdoors (atmosphere) of a minimum of three (3) square feet is required for each gas dryer and 72 Kw electric dryer and a minimum of five (5) square feet for each steam dryer and 80 Kw electric dryer.

To compensate for the use of registers or louvers used over the openings, this make – up air area **must be** increased by approximately thirty – three (33) percent. 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 six (6) gas dryers, two (2) openings measuring 3 feet by 3 feet (18 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.



**Figure.3-5** Fresh Air Supply

## INSTALLATION PROCEDURES

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

**NOTE:** Component failure due to dry cleaning solvent fumes. **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 air flow (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 **POTENTIAL FIRE HAZARD.**

**NOTE:** When a dryer is exhausted separately, it is recommended that a back draft damper be installed.

**NOTE:** When dryers are exhausted into a multiple (common) exhaust line, each dryer **must be** supplied with a back draft damper.

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. When single dryer venting is used, the duct work from the dryer to the outside exhaust outlet **should not** exceed twenty (20) feet.

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 critical so long as the minimum cross section area is provided. It is suggested that the use of 90° turns in ducting 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. Excluding basket / 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 section area of the duct work **must be** increased in proportion to number of elbows added.

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.

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

**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.

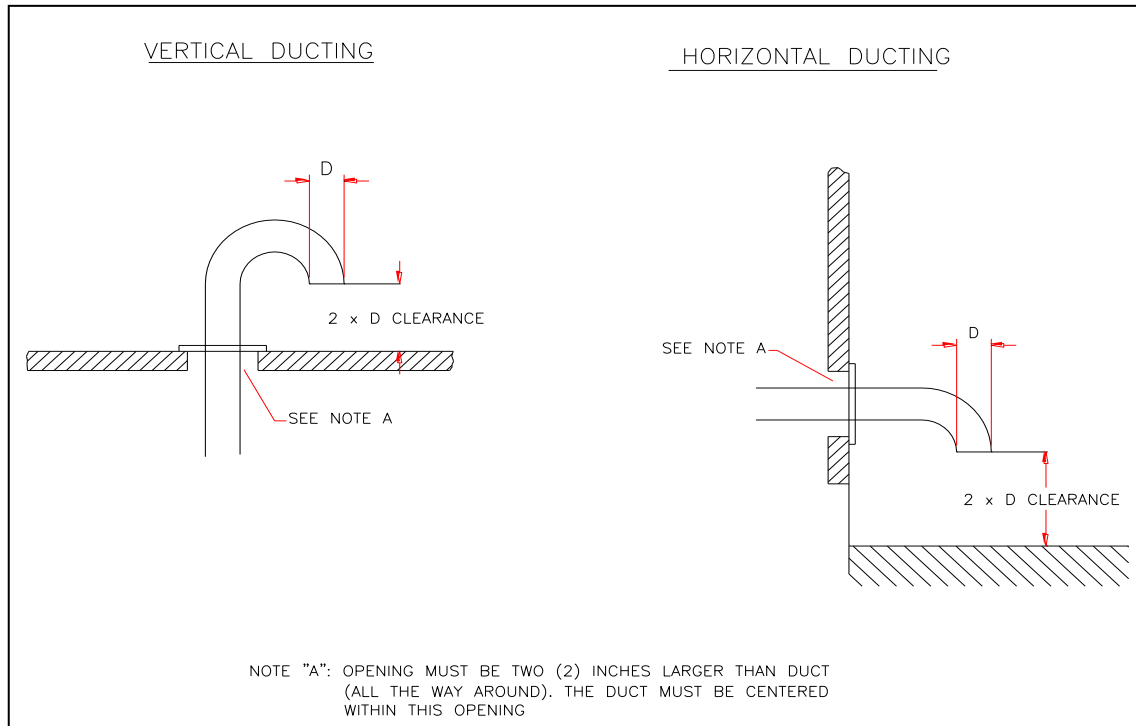


## INSTALLATION PROCEDURES

### Outside Duct Work Protection

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 exhaust 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.



**Figure.3-6** Outside Duct Work Protection

## 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 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.

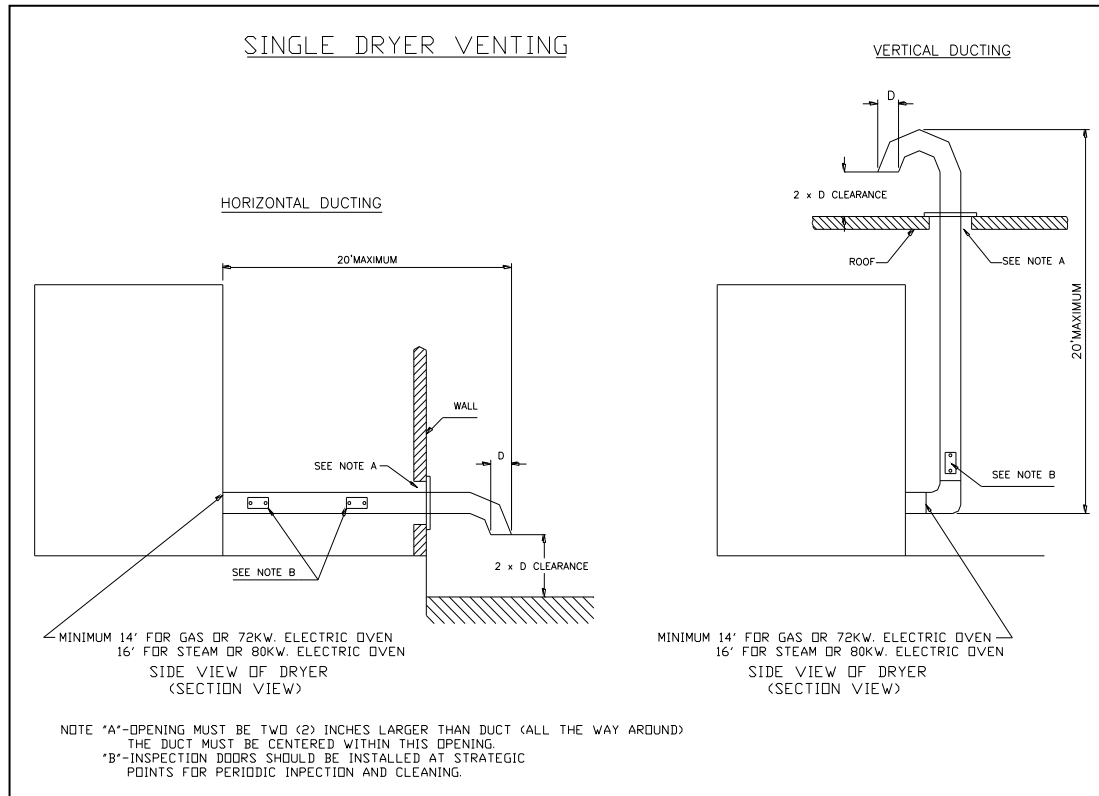
**IMPORTANT:** Minimum duct size for a gas dryer or 72 Kw electric dryer is 14 – inches for a round duct or 12.50” × 12.50” for a square duct. The minimum duct size for a steam dryer or 80 Kw electric dryer is 16 – inches for a round duct or 14.50” × 14.50” for a square duct. Duct size **must not be** reduced anywhere down stream of 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.

It is suggested that the duct work from each dryer (minimum 14 – inches for a gas dryer or 72 Kw electric dryer and 16 – inches for a steam dryer or 80 Kw electric dryer) not exceed twenty (20) feet with no more than two (2) elbows (excluding dryer connections and outside exhaust outlets). If the duct work exceeds twenty (20) feet or has numerous elbows, the cross section area of

## INSTALLATION PROCEDURES

the duct work **must be** increased in proportion to the length and number of elbows in it. In calculating duct size, the cross section area of a square or rectangular duct **must be** increased by twenty (20) percent for each additional twenty (20) feet. The diameter of a round exhaust duct **should be** increased ten (10) percent for each additional fifteen (15) feet. Each 90° elbow is equivalent to an additional thirty (30) feet, and each 45° elbow is equivalent to an additional fifteen (15) feet.



**Figure.3-7** Single Dryer Venting

**IMPORTANT:** For extended duct work runs, the cross section area of the duct work can only be increased to an extent. Maximum proportional duct work runs **cannot** exceed twenty (20) feet more than the original limitations of twenty (20) feet with two (2) elbows. When the duct work approaches the maximum limits as 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.

### Outside Duct Work Protection

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 exhaust duct work travels

## INSTALLATION PROCEDURES

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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 nearest obstruction.

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

### 3. Multiple Dryer (Common) Venting

If it **is not** feasible to provide separate exhaust ducts for each dryer, ducts from individual dryers may be channeled into a “common main duct”. The individual ducts should enter the bottom or side of the main duct at an angle not more than 45° in the direction of air flow and **should be** spaced at least 48 3/8 inches apart. The main duct **should be** tapered, with the diameter increasing before each individual 14 – inches (minimum for gas dryers or 72 Kw electric dryers) or 16 – inches (minimum for steam dryers or 80 Kw electric dryers) duct is added.

**IMPORTANT:** The Dryer – 100 lb. **is not** provided with a back draft damper. When exhausted into a multiple (common) exhaust line, a back draft damper **must be** installed at each dryer duct.

**IMPORTANT:** **NO** more than four (4) dryers **should be** connected to one main common duct.

The main duct may be any shape or cross sectional area, so long as the minimum cross section area is provided. The minimum cross section area for multiple dryer round or square venting. These figures **must be** increased 10 square inches when rectangular main ducting is used, and the ratio of duct width to depth **should not be** greater than 3 – 1/2 to 1. These figures **must be** increased in proportion if the main duct run to the last dryer to where it exhausts to the outdoors is unusually long (over twenty (20) feet) or has numerous elbows (more than two (2)) in it. In calculating duct work size, the cross section area of a square or rectangular duct **must be** increased twenty (20) percent for each additional twenty (20) feet. The diameter of a round exhaust **must be** increased ten (10) percent for each additional twenty (20) feet. Each 90° elbow is equivalent to an additional thirty (30) feet and each 45° elbow is equivalent to an additional fifteen (15) feet.

**IMPORTANT:** For extended duct work runs, the cross section area of the duct work can only be increased to an extent. Maximum proportional duct work runs **cannot** exceed twenty (20) feet more than the original limitations of twenty (20) feet with two (2) elbows. When the duct work approaches the maximum limits as noted in this manual, a professional HVAC firm **should be** consulted for proper venting information.

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

The 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 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.

## **INSTALLATION PROCEDURES**

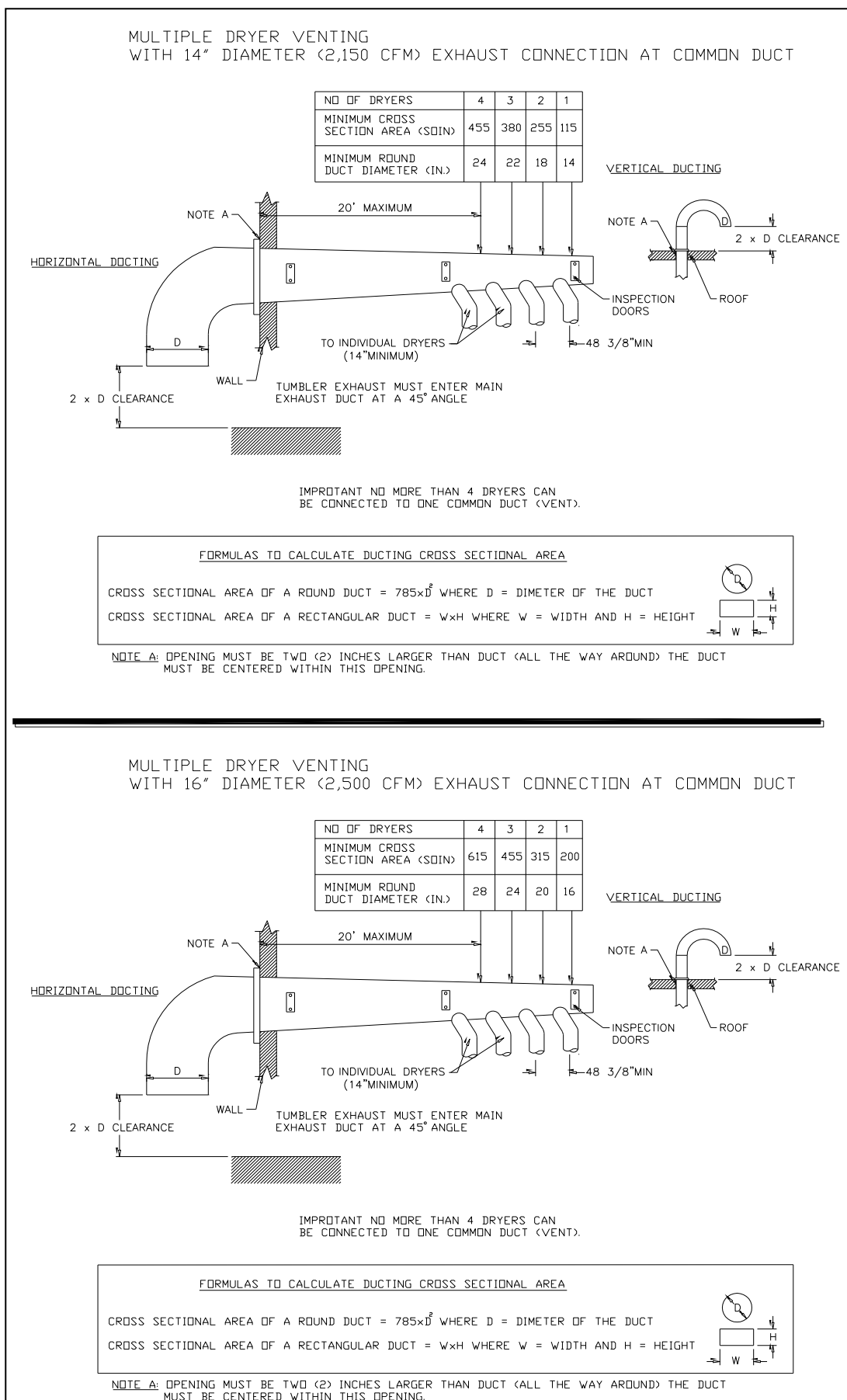
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### **Outside Duct Work Protection**

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 exhaust 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 nearest obstruction.

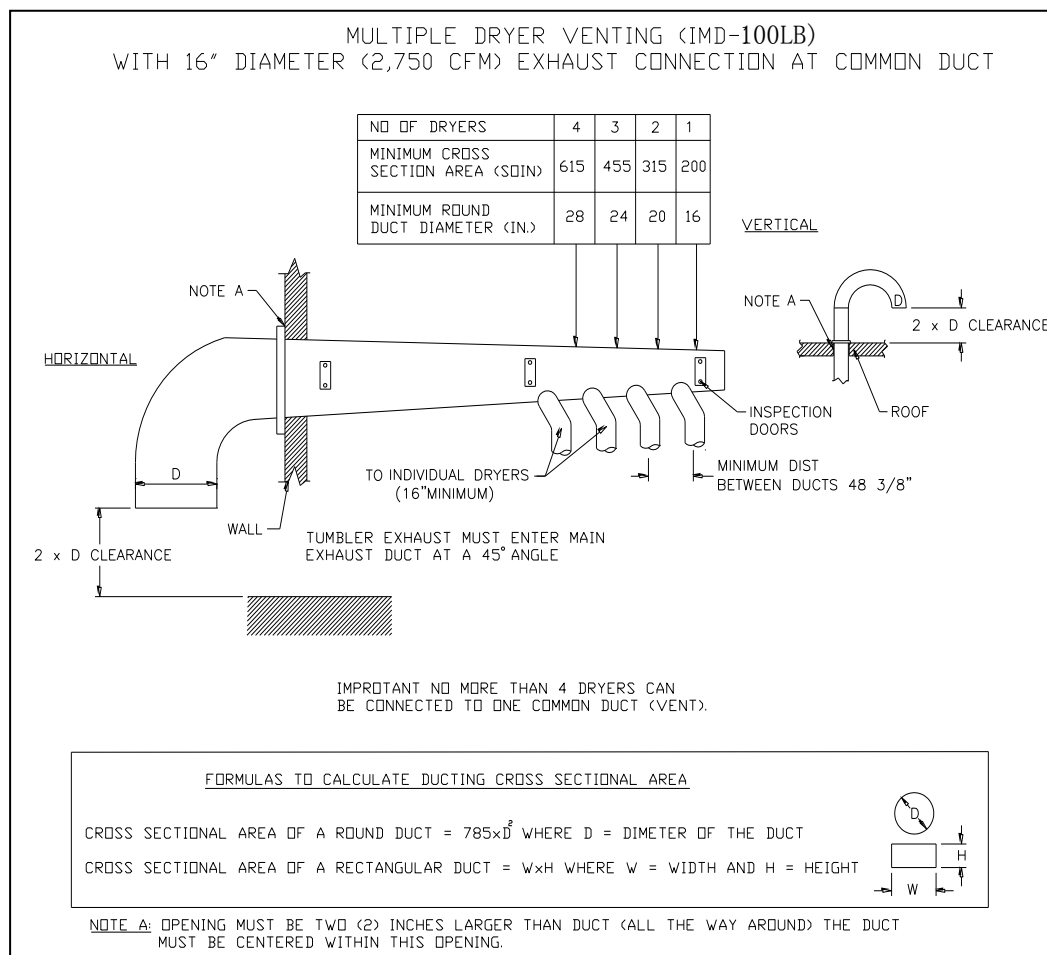
**IMPORTANT:** **DO NOT** use screens, louvers, or caps on the outside of opening of exhaust duct work.

## INSTALLATION PROCEDURES



**Figure.3-8 Multiple exhaust connection**

## INSTALLATION PROCEDURES



**Figure.3-9** Multiple exhaust connection

## 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 to 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, or in Canada, the Canadian Electrical Codes Parts 1 & 2 CSA C22.1 – 1990 or 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 amp city and insulation in accordance with electric codes for making all service connections.

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

## INSTALLATION PROCEDURES

**NOTE:** Wiring diagrams are affixed to the inside at the top front control door and to the rear upper back guard / panel.

### 2. Electrical Service Specifications

**Table 3-1** Electric Service Specifications

Model 100 lb, Electrical, Gas and Steam (72 KW For Electric Heater)							
<b>IMPORTANT:</b> 208 V AC and 200-240 V AC ARE NOT THE SAME. When ordering, specify exact voltage. <b>NOTES:</b> A. Fuse ratings are dual element-time-delay-current limiting, class RK1 or RK5 only. B. Circuit breakers are thermal magnetic (industrial) type only. 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 must be 3-pole type.							
Service Voltage	Phase	Approx. Amp Draw		Wire Size		Circuit Breaker	
		Gas, Steam	Elec.	Gas, Steam	Elec.	Gas, Steam	Elec.
200-240	3	15.2	-	12AWG/4sq.mm.	-	20	-
380-415	3	10.0	119	14AWG/2.5sq.mm.	-/50sq.mm.	15	150
440-480	3	9.1	104	14AWG/2.5sq.mm.	-/50sq.mm.	15	150

\*AWG Stranded Type Wire...for individual lengths less than 100 feet.

(Motor lead type wire is recommended.)

**IMPORTANT:** The dryer **must be** connected to the electrical 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.

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

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

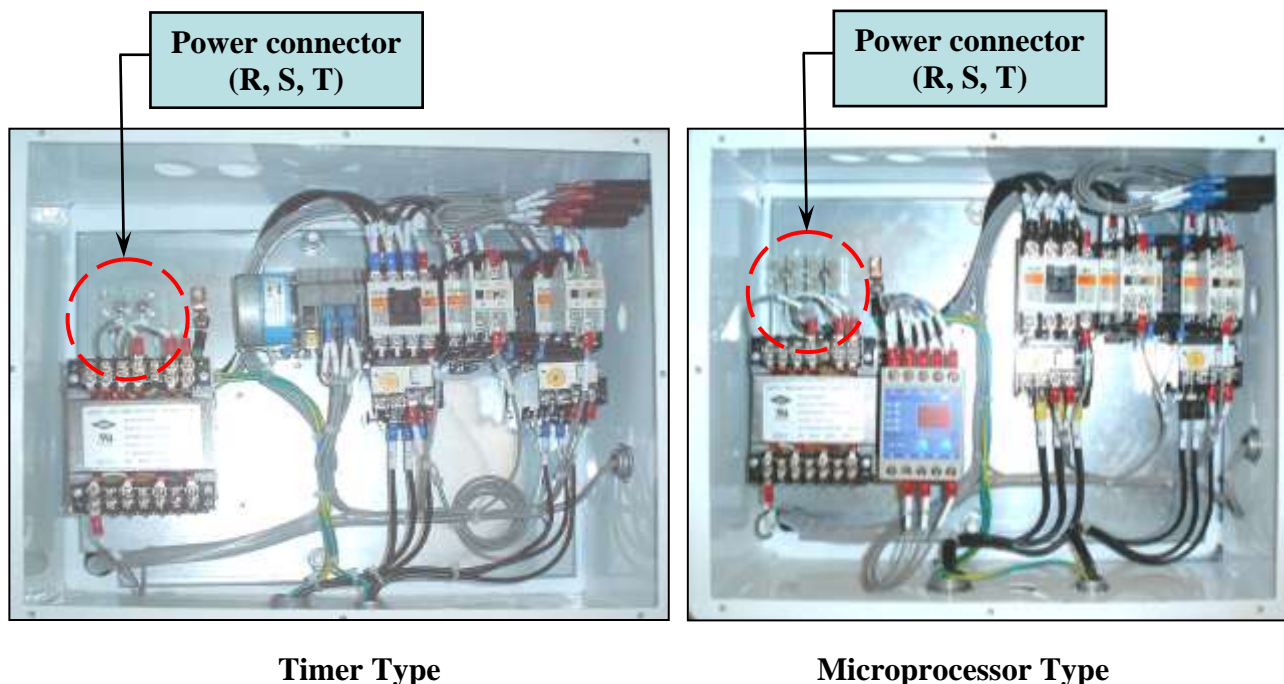
### 3. Electrical Connections

**NOTE:** A wiring diagram is included with each dryer and is affixed to the rear, upper right guard / panel of the dryer.

The only electrical input connections to the dryer are the 3 – phase (3Ø) power leads (L1, L2, and L3), Ground, and in the case of 4 wire service, the neutral. Providing local codes permit, power connections to the dryer can be made by the use of a flexible underwriters laboratory listed cord / pigtail (wire size **must conform** to rating of the dryer), or the dryer can be hard wired directly to the service breaker. In all cases, a strain relief **must be** used where the wire(s) enter the dryer electrical service (relay) box

### a. Gas Model and Steam Model Dryer

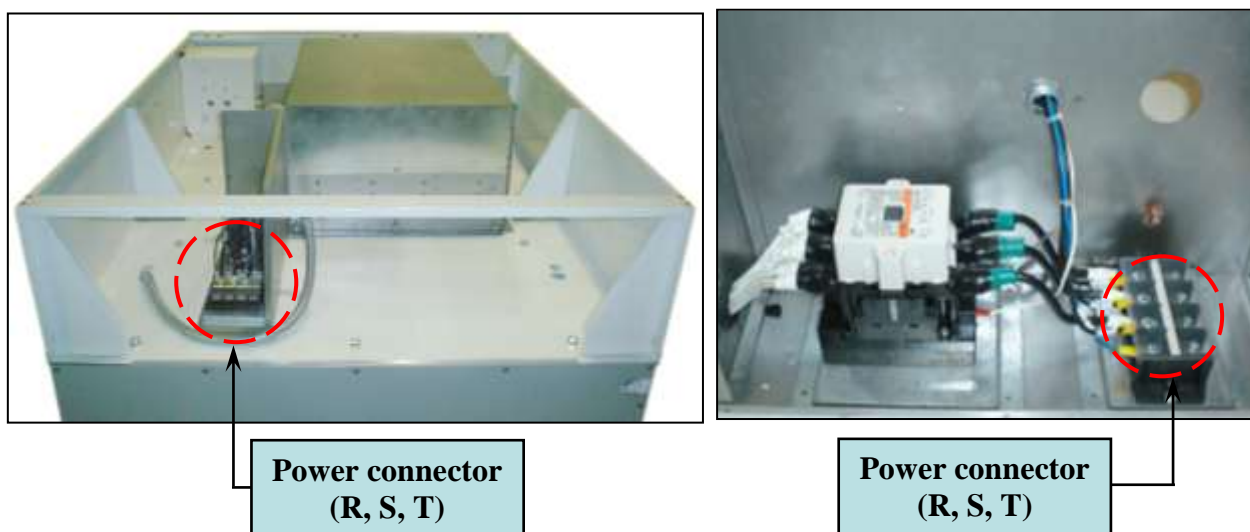
These electrical connections are made at the terminal block located in the electric service / relay box at the rear, upper left hand corner of the dryer. To gain access into this service box, the service cover (upper back guard) **must be** removed.



**Figure.3-10** Electric Power Connector, Gas and Steam Model

### b. Electric Model Dryer

For electric model dryers made to operate at 208 VAC, 230 VAC, or 240 VAC, the electrical input connection is made into the terminal block located at the upper rear of the dryer. For electric model dryers made to operate at 380 VAC, 416 VAC, 440 VAC, or 480 VAC, the electrical input connection is made to the oven relay located at the upper rear of the dryer. Input connection wiring **must be** sized properly to handle the dryer's current draw. This information is printed on the dryer's data label which is affixed to the rear, upper right hand corner of the dryer.



**Figure.3-11** Electric Power Connector, Electric Heater Model



## INSTALLATION PROCEDURES

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**NOTE:** A circuit serving each dryer **must be** provided.

### 4. Grounding

Grounding (earth) connections **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, or in Canada, the Canadian Electrical Codes Parts 1 & 2 CSA C22.1 – 1990 or LATEST EDITION. The ground connection may be to a proven earth ground at the location service panel.

**NOTE:** A grounding connection (terminal plug) is provided in the dryer electrical service / relay box at the rear.

For added personal safety, when possible, it is suggested that a separate ground wire (sized per local codes) be connected from the ground connection of the dryer to a grounded cold water pipe. **DO NOT** ground to a gas or hot water pipe. The grounded cold water pipe must have metal to metal connections all the way to 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. For proper operation of the microprocessor (computer), an earth (zero) ground is required.

**NOTE:** Grounding via metallic electrical conduit (pipe) **is not** recommended.

## 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 to local and state regulations or codes. In the absence of such codes, all plumbing connections, material, and workmanship **must conform** to the applicable requirements of the National Fuel Gas Code ANSI Z223.1 – LATEST EDITION, or in Canada, the Canadian Installation Codes CAN/CGA – B149.1 – M91 (Natural Gas) or CAN/CGA – B149.2 – M91 (L.P. Gas) or 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 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). The dryer **must be** isolated from the gas supply piping system by closing its individual manual shut – off valve during any pressure testing of the gas supply piping 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 valves **VOIDING 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 Z223.1 – LATEST EDITION, or in Canada, the Canadian Installation Codes CAN/CGA – B149.1 – M91 (Natural Gas) or CAN/CGA – B149.2 – M91 (L.P. Gas) or LATEST EDITION, as well as local codes and ordinances and **must be** done by a qualified professional

## INSTALLATION PROCEDURES

**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 data label affixed to the back of the dryer at the upper right hand corner. 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 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 of 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 Dryer factory.

## 2. Technical Gas Data

**Table 3-2** Technical Gas Data

Description	Type of Gas	
	Natural (NG)	Liquid Propane (LPG)
Manifold Pressure	3.5 - 4.0 inches H <sub>2</sub> O.	10.5 - 11.0 inches H <sub>2</sub> O.
Inline Pressure	4.5 - 14.0 inches H <sub>2</sub> O.	12.0 - 14.0 inches H <sub>2</sub> O.
Drill Nozzle Size (Hole)	4 mm.	3 mm.
Inlet supply size (Minimum)	1-1/2 inches	1-1/4 inches
Inlet connection	1 inches	3/4 inches

### 1) Natural Gas

Regulation is controlled by the dryer gas valve's internal regulator. Incoming supply pressure **must be** consistent between a minimum of 4.5 inches and a maximum of 14.0 inches water column 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. 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.

**Table 3-3** Gas Data

Machine Model	Consumption (Btu/hr)
Dryer 100 lb.	375,000

## 3. Piping / Connections

All components / materials **must conform** to National Fuel Gas Code Specifications or in Canada, the Canadian Installation Codes (for General Installation and Gas Plumbing). 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.

## INSTALLATION PROCEDURES

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The dryer is provided with a 1 – inch N.P.T. inlet pipe connection extending out the back area of the burner box. The minimum pipe size connection (supply line) to the dryer is 1 – inch N.P.T. For ease of 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. gas, the supply tank, other gas – operated appliances on the same supply 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.

Consistent gas pressure is essential at all gas connections. It is recommended that a 1 – 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.

**IMPORTANT:** A water column pressure of 3.5 to 4.0 inches for natural gas and 11.0 inches for L.P. dryers is required at the gas valve pressure tap of each dryer for proper and safe operation.

A 1/8 – inch 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 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 Fuel Gas Code Specifications ANSI Z223.1 – LATEST EDITION, or in Canada, the Canadian Installation Codes CAN/CGA – B149.1 – M91 (Natural Gas) or CAN/CGA – B149.2 – M91 (L.P. Gas) or LATEST EDITION.

It is important that gas pressure regulators meet applicable pressure requirements, and that gas meters be rated for the total amount of 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 testing of the gas supply piping system at test pressures equal to or less than 1/2 psig (3.5 kPa).

## INSTALLATION PROCEDURES

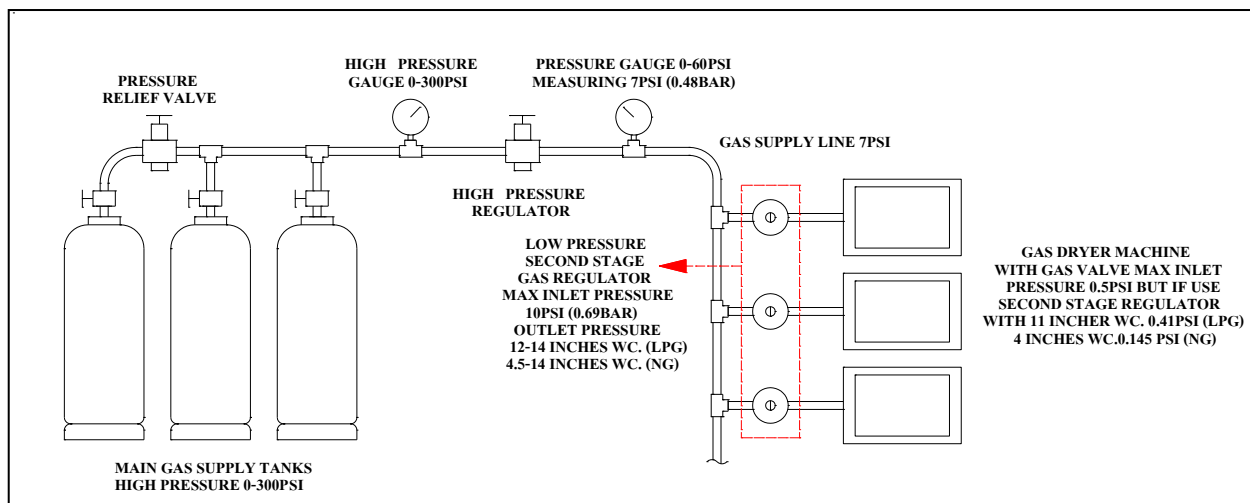


Figure.3-12 Typical of Gas Installation

### H. STEAM INFORMATION

It is your responsibility to have all steam plumbing connections made by a qualified professional to assure that the installation is adequate and conforms to 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 DE – 100 lb. is manufactured with a pneumatic (piston) damper system which requires an external supply of clean, dry, regulated air (80 Psi  $\pm$  10 Psi). Refer to **Steam Damper Air System Connections, Section H, item 3.**

#### 1. Steam Requirements. High Pressure

- Inlet --- 1 – 1/4 – inch supply line connection – Qty. one (1) at top manifold.
- Return --- 1/2 – inch return line connection – Qty. one (1) at bottom manifold.

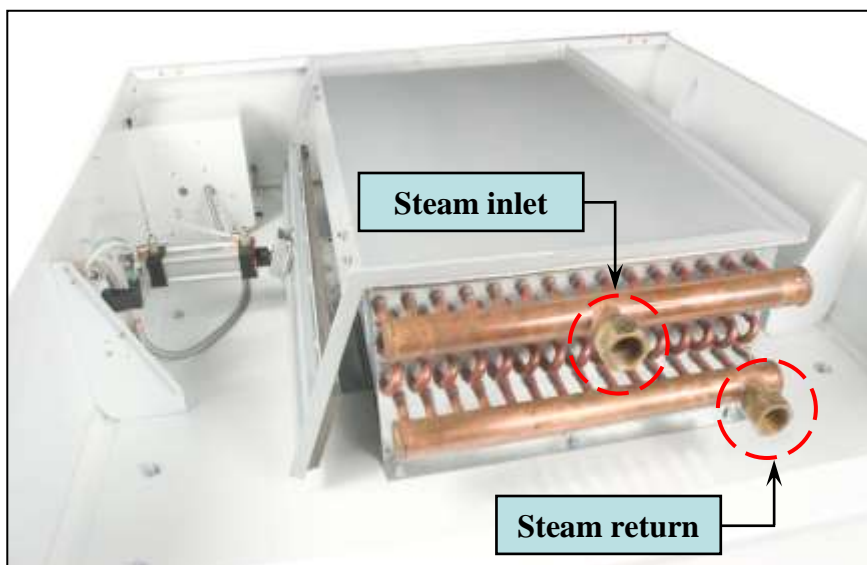


Figure.3-13 Typical of Steam Installation



**Figure.3-14** Steam Valve Connection

**Table 3-4** Steam Requirements High Pressure

Operating Steam Pressure	
Maximum	125 psig
Minimum	100 psig
Heat Input (Normal Load)	19 Bhp
Consumption (Approximate)	655.5 lb. / hr

## 2. Installation Instructions

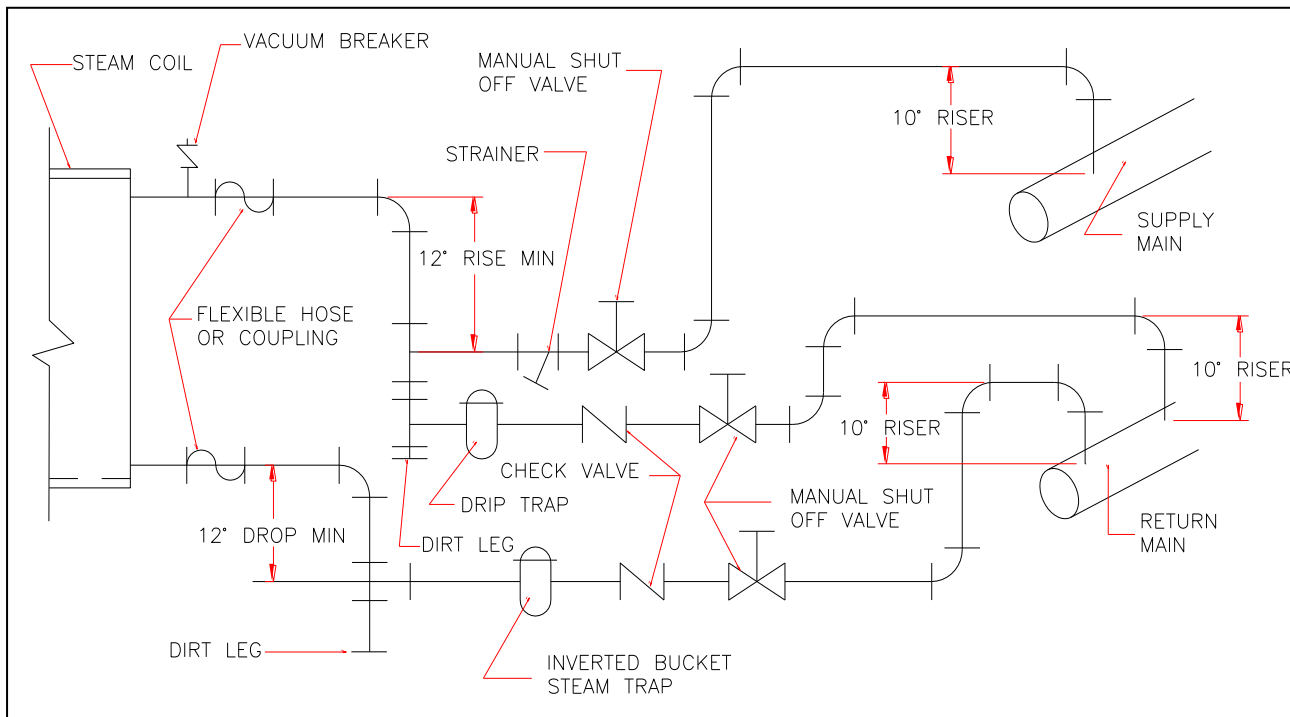
To insure that an adequate supply of steam is provided, be sure that the steam supply and steam return lines are sized and laid out as stipulated in this manual. Inadequate steam supply and steam return lines or improper steam plumbing will result in poor performance and can cause component failure.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

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

- 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 – inches riser. This will prevent any condensate from draining towards the dryer.
- The steam supply piping to the dryer **must include** a 12 – inches rise along with a drip trap and check valve. This will prevent any condensate from entering the steam coil.
- 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.
- Shut – off valves for each dryer **should be** installed in the supply, return, and drip trap return lines. This will allow the dryer to be isolated from the supply and return mains if the dryer needs maintenance work.
- Install an inverted bucket steam trap and check valve for each unit at least 12 – inches below steam coil as close to the coil as possible. A trap with a capacity of 1,200 pounds of condensate per hour at 125 Psi is needed for each unit.
- A 3/4” vacuum breaker **should be** installed for each unit in the piping. This will prevent the condensing steam from causing a vacuum inside the coil and possibly damaging the coil.

## INSTALLATION PROCEDURES

- g. The supply and return lines **should be** insulated. This will save energy and provide for the safety of the operator and maintenance personnel.
- h. Water pockets in the supply line, caused by low points, will provide wet steam to the coil possibly causing 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 any condensate in the line to drain to the header. Install a bypass trap in any low point to eliminate wet steam.



**Figure.3-15** Typical of Steam System

### 3. Steam Damper Air System Connections

The Dryer – 100 lb. 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 above the electric service relay box

#### a. Air Requirements

**Table 3-5** Steam Damper Air System Connections

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

#### b. Air Connection

Air connection to system 8 mm.

No air regulation 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

## INSTALLATION PROCEDURES

compressed air line just before the dryer connection. This is necessary to insure that correct and clean air pressure is achieved.

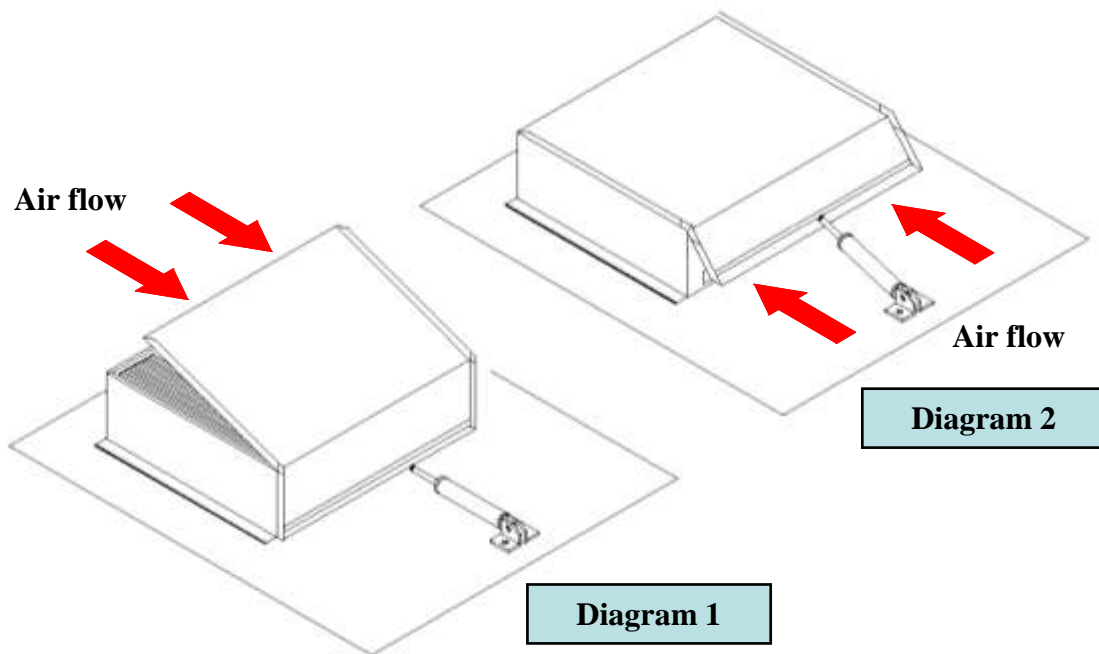
### 4. Steam Damper System Operation

The Dryer – 100 lb. steam damper, 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 1 shows the damper in the heating (open) mode, allowing heat into the basket (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.

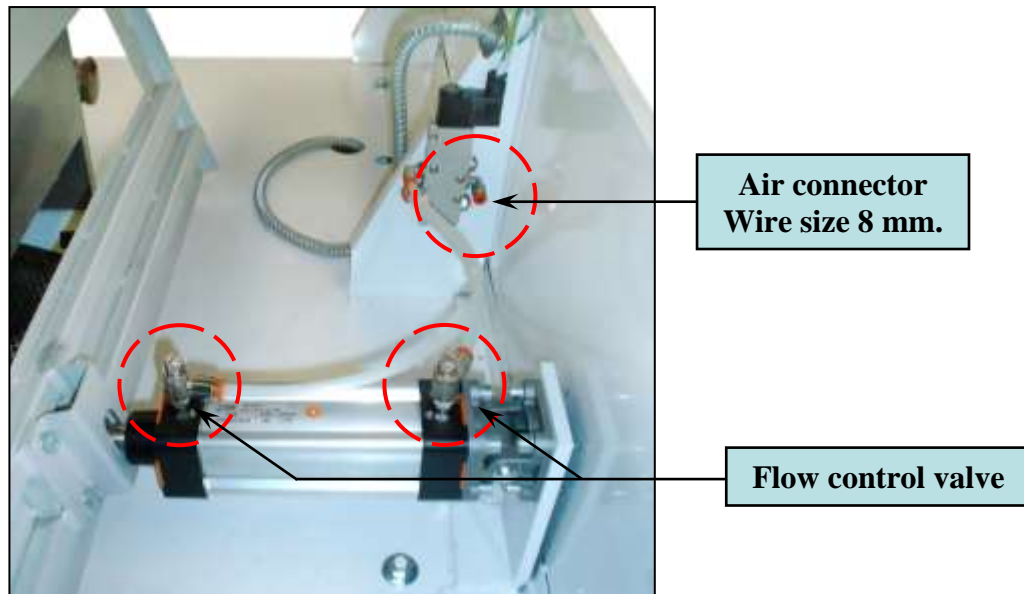
**NOTE:** With the dryer off or with no air supply, the damper is in the cool down mode as shown in Diagram 2.



**Figure.3-16** Steam Damper System Operation

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

Although the 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. damper air adjustment is necessary, locate flow control valve and make necessary adjustments as noted below.



**Figure.3-17** Steam Damper Operation Adjustment

### I. PREPARATION FOR OPERATION / START UP

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

1. Read and follow 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 located in the front top console area. 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 MODELS:** The sail switch damper assembly was installed and readjusted 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 lint drawer is securely in place.

**NOTE:** Lint drawer **must be** all the way in place to activate safety switch other wise the Dryer will not start.

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 on 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. PRE - OPERATIONAL 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.
2. Make sure the main door is closed and the lint drawer is securely in place.
3. Refer to the Operating Instructions for starting your particular model dryer.
4. Check to insure that the basket (tumbler) starts in the clockwise (CW) direction. Additionally, check the direction of the blower motor impellor (fan) to insure that impellor (fan) rotates in the clockwise (CW) direction as viewed from the front. If it is, the phasing is correct. If the phasing is incorrect, reverse two (2) of the leads at L1, L2, or L3 of the power supply connections made to the dryer.

**IMPORTANT:** Dryer blower motor impellor / fan as viewed from the front **must turn** in the clockwise (CW) direction, otherwise dryer efficiency will drastically be reduced and premature component failure can result.

#### 5. Heat Circuit Operational Test

##### 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.
- 2) The dryer is equipped with a direct spark ignition (DSI) system which has internal diagnostics. If ignition is not established after the first attempt, the heat circuit DSI module will lock out until it is manually reset. To reset the DSI system, open and close main door and restart dryer (press the “**ENTER / START**” key).

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

- 3) Once ignition is established, 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 Water Column

**L.P. Gas.....** 10.5-11 Inches Water Column

**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.

##### Electric Models

Check the oven contactor(s) to insure that the electric oven is cycling properly.

##### Steam Models

## INSTALLATION PROCEDURES

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Check to insure that steam damper is functioning properly.

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 occurs, the flow control **must be** adjusted. Refer to the bottom illustration for air adjustment instructions.

6. Make a complete operational check of **all** safety – related circuits (i.e., lint drawer switch, and sail switch on gas models).

**NOTE:** To check for proper sail switch operation, open the main door and while holding main door switch plunger in, start dryer. Dryer **should start** but heat circuit **should not be** activated (on). If heat (burner) does activate, shut dryer off and make necessary adjustments.

7. A reversing basket (tumbler) dryer **should never be** operated with less than a 60 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.

### Microprocessor (computer) Dryer Models

- 1) Spin 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 and stop times are adjustable in the Manual (timed) Mode.

### Dual Timer Dryer Models

Spin and stop times are adjustable at the reversing timer.

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

8. Each dryer **should be** operated through one complete cycle to assure that no further adjustments are necessary and that all components are functioning properly.
9. Make a complete operational check of all operating controls.

### Microprocessor controller (computer) programs / selections

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.

### Dual timer dryers check.

- 1) Heating Timer
- 2) Cool Down Timer
- 3) Temperature Selection Switch

## **SECTION 4**

### **OPERATING AND PROGRAMMING INSTRUCTIONS**

#### **A. OPERATING INSTRUCTIONS**

**NOTE:** Before attempting to start the dryer make sure that the main door is closed and the lint drawer is securely in place.

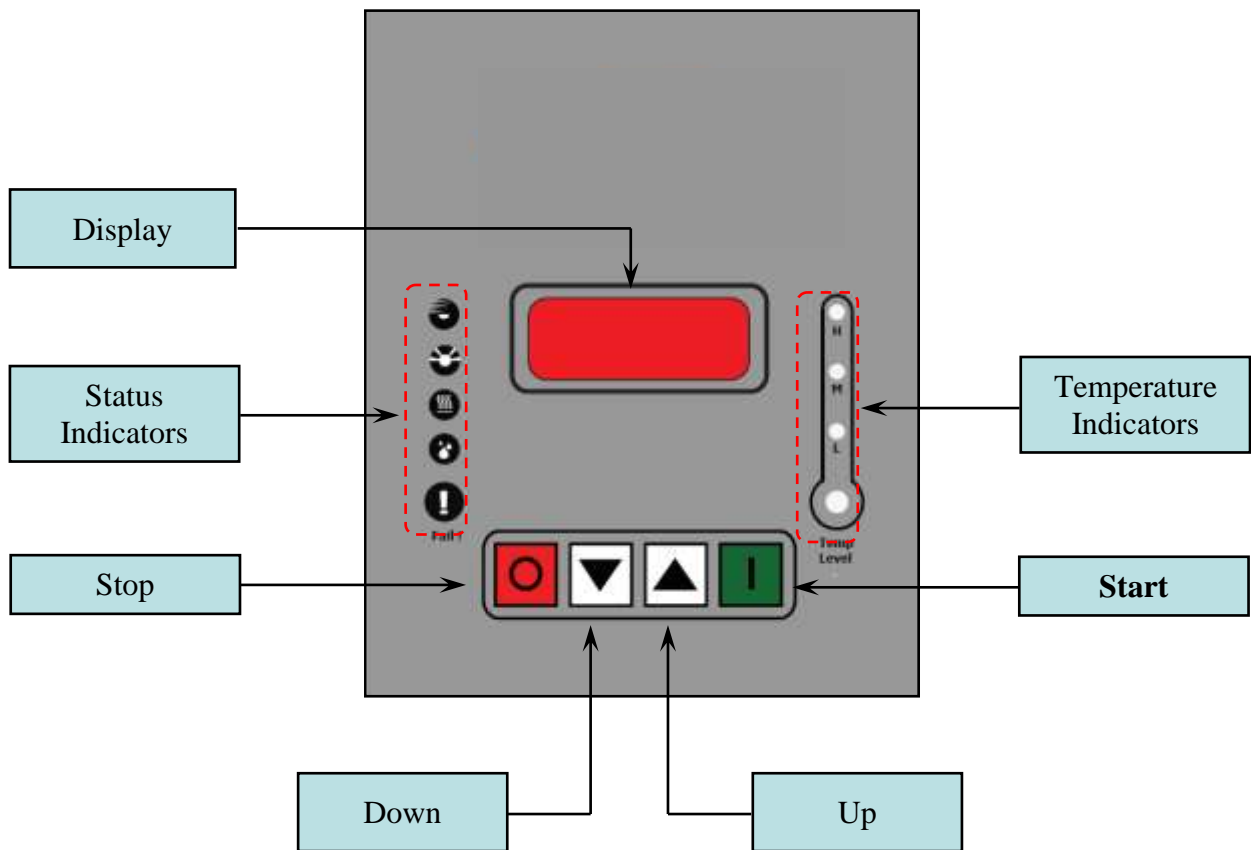
#### **AUTOMATIC USUAL TUMBLE**

1. Energize the electrical circuit to the tumbler at the disconnect switch or the circuit breaker. The display is show “t002” about 3 second and then show P1 – P10.
2. Open the lint panel and check for any accumulated lint on lint screen. Close panel tightly against tumbler frame and lock panel securely.
3. Open the cylinder door and load the cylinder with laundry. Overloading will result in excessive drying time, wrinkled laundry, and wear to cylinder bearings.
4. Press “UP”, “DOWN” button to select program P1 – P10.
5. Press “Start” button to run the machine the display is show countdown time.

The Dryer will start beginning with heating. When working completed time of in the program. The heating system stops working. Then the cool down is working until completed time the Dryer is stop

**IMPORTANT:** If the cylinder door is opened during the cycle, the heating system will shut – off and the motor will stop. To restart the cycle, door **must be** closed and the **PUSH – TO – START** button **must be** pressed in and held for approximately three seconds.

6. When the cycle is completed, open door and remove the laundry.



**Figure.4-1** Control Panel

## B. DESCRIPTION OF CONTROL



Stop Button.



Start / Enter Button.



Down Arrow Button.



Up Arrow Button.



Indicator for dry time.



Indicator for cool down time.



Indicator for heater is operating.



Indicator for humidity sensor is operating. (Optional)



Indicator when a malfunction occurs.



Show on the working temperature 90 ° C (High Heat).



Show on the working temperature 82 ° C (Medium Heat).



Show on the working temperature 65 ° C (Low Heat).



Show when the program is running without a temperature 0 ° C (No Heat).

## C. SETTING THE PROGRAM

1. Energize the electrical circuit to the tumbler at the disconnect switch or the circuit breaker. The display is show “t002” about 3 second and then show P1 – P10.
2. Press Up and Down button together the display is show ---- and then put the password (9999)
3. Press the Down button to enter the password for each digit, press the Enter button to move. When entering the password, press Enter, and then select the desired setting (C1 - C10) and then press the Enter key again to enter the program. This can be set up as follows.

### 3.1 Time Setting

- Setting time for drying. Can be set from 0 – 240 minutes.
- Setting a time for cool down. Can be set from 0 – 240 minutes.

**NOTE:** During Running the machine on the monitor show A-Z that it means time over 100 minute.

Display Run Screen	Time Run /Minute	Setting Ability
<b>A1</b>	101	101-110
<b>b1</b>	111	111-120
<b>C1</b>	121	121-130
<b>d1</b>	131	131-140
<b>E1</b>	141	141-150
<b>F1</b>	151	151-160
<b>G1</b>	161	161-170

<b>H1</b>	171	171-180
<b>I1</b>	181	181-190
<b>J1</b>	191	191-200
<b>K1</b>	201	201-210
<b>L1</b>	211	211-220
<b>m1</b>	221	221-230
<b>n1</b>	231	231-240
<b>O1</b>	241	241-250
<b>P1</b>	251	251-260
<b>q1</b>	261	261-270
<b>r1</b>	271	271-280
<b>S1</b>	281	281-290
<b>t1</b>	291	291-300
<b>u1</b>	301	301-310
<b>V1</b>	311	311-320
<b>W1</b>	321	321-330
<b>X1</b>	331	331-340
<b>Y1</b>	341	341-350
<b>Z1</b>	351	351-360

### 3.2 Temperature Setting (Press the "Up" or "Down" to select temperature.)

- Setting Low Heat can be set to any value from 35 - 65 ° C (factory setting value is 65 ° C).
- Setting Medium Heat can be set to any value from 66 - 82 ° C (the factory setting is 82 ° C).
- Setting High Heat can be set to any value from 83 - 93 ° C (factory setting value is 90 ° C).

### 3.3 Humidity Sensor Setting (Optional)

- The humidity can be set from 0 - 35%.
- In case disable, set at 0.

## **D. SETTING THE CONTROLLER**

The configuration of the controller is as follows.

- Press Up, Down, and then the program will ask for a password (password is 9999) to the C0 – C10, then press the Enter button to settings the controller.

## OPERATING AND PROGRAMMING INSTRUCTIONS

- PaSS: (change the password) can change the password.
- tFtr: (setting Forward / Reverses) can be set at the turn of the basket is a Forward / Reverse.
- trot: (set the rotation of the basket) can be set from 3 – 90 seconds.
- tstP: (set time to stop rotation of the basket) can be set to stop the rotation of the basket from 0-60 seconds.
- Anti: (set to anti crease) can be set to anti crease.
- trEF: (the reference temperature) is the temperature. Has the same value as the program runs.
- buZZ: (warning time) can set the alarm time from 0-99 seconds, but if it is set to 0, the alarm always.
- AtEd: (the end of operation setting) can be set to working by the end of which the time or the temperature is set to 0, it will be the end of the working of time. If set to 1 to 99 to the end of the working the temperature.
- dtP1: (the actual temperature at the time) while present temperature setting
- dAEn: Blower auto clean option can setting 0-10 Second.
- UdeN: Setting out put WD relay for use in equipment option (Tilt system/Door lock system).
- tC: Setting function of the temperature sensor and humidity sensor.
- tC0: Setting function of moisture sensor (Option).
- tC1: Setting function in temperature sensor.
- Unlt: Setting temperature unit (°CEL/°FAH).

### E. MEANING OF THE ALARM MESSAGE

MESSAGE	CAUSE
<b>door</b>	<ul style="list-style-type: none"><li>- Door is not closed all the way.</li><li>- Door switch out of proper adjustment.</li><li>- Failed door switch.</li><li>- Broken connection / wire in main door circuit.</li><li>- Failed 24 VAC transformers.</li></ul>
<b>AH</b>	<ul style="list-style-type: none"><li>- Temperature is over than 110 °C</li></ul>
<b>tSFL</b>	<ul style="list-style-type: none"><li>- Temperature is lower than 20 °C</li></ul>
<b>OL</b>	<ul style="list-style-type: none"><li>- Drive motor is over current or has failed.</li><li>- Blower motor is over current or has failed.</li></ul>

## **OPERATING AND PROGRAMMING INSTRUCTIONS**

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<b>dP</b>	<ul style="list-style-type: none"><li>- Sail switch (rear the machine) is out of adjustment or has failed.</li><li>- Failed direction of blower or blower is not operation.</li><li>- Filter (lint drawer) is not clean.</li></ul>
<b>Ld</b>	<ul style="list-style-type: none"><li>- lint drawer is open</li></ul>
<b>LF</b>	<ul style="list-style-type: none"><li>- Lint drawer is not closed all the way.</li><li>- Lint drawer switch out of proper adjustment.</li><li>- Failed lint drawer switch.</li><li>- Broken connection / wire in main door or lint drawer circuit.</li><li>- Failed 24 VAC transformers.</li></ul>



## **SECTION 5**

### **WARRANTY INFORMATION**

#### **A. RETURNING WARRANTY CARD(S)**

Before any dryer leaves the Dryer factory test area, a warranty card is affixed to the glass of the main door. These warranty cards are intended to serve the customer in two ways. First, when Dryer receives the warranty card(s) back from a customer, we mail the appropriate parts manual (at no charge), to the address indicated on the returned card. Second, we record the individual installation date and warranty information to better serve you should you file a warranty claim. If a warranty card did not come with your dryer, contact the Dryer Warranty Department

#### **B. WARRANTY**

For a copy of the Dryer commercial warranty covering your particular dryer(s), contact the Dryer distributor from whom you purchased the equipment and request dryer warranty form. If the distributor **cannot** be contacted or is unknown, warranty information can be obtained from the factory the Dryer Warranty Department

**NOTE:** Whenever contacting the Dryer 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 PART(S)**

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

1. No parts are to be returned to Dryer 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.

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 (Dryer P/N 450064) are available at “no charge” from Dryer upon request.

## **WARRANTY INFORMATION**

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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 Dryer 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 Dryer 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 the claim. If a reply is not received by the Dryer 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 6**

### **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 circulation. If the guidelines in this section are met a 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 be 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 and clean lint from lint drawer / screen every third or fourth load.

**NOTE:** Frequency can best be determined at each location.

**1. DAILY** (beginning of each work shift)

Inspect lint screen and replace if torn.

**2. WEEKLY**

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

**WARNING:** To avoid the hazard of electrical shock, discontinue electrical supply to the Dryer.

**STEAM DRYERS:**

Clean 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 fins are bent, straighten by using fin comb which is available from local air conditioning supply houses.

**3. 90 DAYS**

Remove lint from around basket (tumbler), drive motors, and surrounding areas. Remove lint from gas valve burner area with a dusting brush or vacuum cleaner attachment.

**NOTE:** To prevent damage, avoid cleaning and / or touching igniter / flame – probe assembly.

Remove lint accumulation from inside control box and at rear area behind control box. Impeller (fan / blower) bearings are sealed bearings **should not be** lubrication is required.

## ROUTINE MAINTENANCE

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### 4. EVERY 6 MONTHS

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

Impeller (fan / blower) belts and drive belts **should be** examined. Cracked and / or seriously frayed belts **should be** replaced. Tighten belts when necessary.

**WARNING:** The accumulation of lint in the exhaust duct work can create a **POTENTIAL FIRE HAZARD**.

**WARNING: DO NOT** obstruct the flow of combustion and ventilation air. Check customer furnished back draft dampers in exhaust duct work. Inspect and remove any lint accumulation which can cause damper to bind or stick.

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

**NOTE:** When cleaning 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 switch, lint drawer switch, sail switch, burner and hi – limit thermostats).

### C. LUBRICATION

1. Impeller motor (fan / blower) bearings are sealed bearing, **NO** lubrication is required.
2. The motor bearings, idler bearings, and main tumbler shaft bearings are permanently lubricated. **NO LUBRICATION IS NECESSARY**.

### SECTION 7

#### TROUBLE SHOOTING

**IMPORTANT:** You must disconnect and lockout the electric supply and the gas supply or the steam supply before any covers or guards are remove 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 suspected 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 precaution displayed on the Dryer or specified in this manual.

#### A. MICROPROCESSOR MODELS

1. **No display (microprocessor (computer) models ONLY).**
  - 1) Service panel fuse blown or tripped breaker.
  - 2) Blown L1 fuse or L2 fuse.
  - 3) Failed microprocessor controller (computer).
2. **Drive motor not operating (does not start).**
  - 1) Failed drive motor contractor (relay).
  - 2) Failed drive motor.
  - 3) Failed microprocessor controller (computer).
3. **Drive motor (reversing) operates in one direction only...stops and restarts in same direction.**
  - 1) Failed reversing contractor (relay).
  - 2) Failed microprocessor controller (computer).
4. **Drive motor operates okay for a few minutes, and 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 the motor.
    - c. Failed motor.
    - d. Basket (tumbler) is binding...check for an obstruction.

## **TROUBLE SHOOTING**

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- e. Failed idler bearing or tumbler bearings.

### **5. Blower motor not operating (does not start).**

- 1) Tripped or failed overload protector.
- 2) Failed blower motor contractor (relay).
- 3) Failed motor.
- 4) Failed microprocessor controller (computer).

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

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

### **7. Both drive motor and blower motor not operating (do not start)...microprocessor (computer) motor indicator dots are on.**

- 1) Failed microprocessor controller (computer).

### **8. Both drive motor and blower motor run a few minutes and stop...microprocessor controller (computer) L.E.D. display continues to read time or percent of extraction and all indicator dots are off.**

- 1) Fault in main door switch circuit.
  - a. Failed main door switch.
  - b. Main door switch out of adjustment.
  - c. Loose connections in the door switch circuit.
- 2) Fault in lint drawer switch circuit.
  - a. Lint drawer switch out of proper adjustment.
  - b. Loose connections in the lint drawer switch circuit.

### **9. Microprocessor controller (computer) display reads “DOOR OPEN”.**

- 1) Fault (open circuit) in main door switch circuit.
  - a. Door is not closed all the way.
  - b. Door switch out of proper adjustment.
  - c. Failed door switch.
  - d. Broken connection / wire in main door circuit.
  - e. Failed 24 VAC transformers.

### **10. Microprocessor controller (computer) display reads “FILTER OPEN”.**

- 1) Fault (open circuit) in lint drawer switches circuit.
  - a. Lint drawer is not closed all the way.
  - b. Lint drawer switch out of proper adjustment.
  - c. Failed lint drawer switch.

## **TROUBLE SHOOTING**

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- d. Broken connection / wire in main door or lint drawer circuit.
- e. Failed 24 VAC transformers.

### **11. Microprocessor controller (computer) display reads “ALM DEPRESSION”.**

- 1) Fault (open circuit) in sail switches circuit (rear the machine).
  - a. Sail switch (rear the machine) is out of adjustment or has failed.
  - b. Failed direction of blower or blower is not operation.
  - c. Filter (lint drawer) is not clean.

### **12. Microprocessor controller (computer) display reads “ALM OVERLOAD”.**

- 1) Fault (open circuit) in overload contactor circuit (electrical box).
  - a. Drive motor is over current or has failed.
  - b. Blower motor is over current or has failed.

### **13. Gas heating unit is not operating (no heat)...no spark at burner area when dryer is first started and heat indicator dot is on.**

- 1) Fault in the sail switch circuit
  - a. Sail switch is out of adjustment or has failed.
  - b. Sail switch damper is not closing or is fluttering.
    - Lint drawer / screen are dirty.
    - Restriction in exhaust.
- 2) Fault in the burner hi – limit circuit or the thermostat.
- 3) Fault in the lint chamber sensor bracket hi – heat protector thermostat.
- 4) Failed Direct Spark Ignition (DSI) module (burner control).
- 5) Failed Direct Spark Ignition (DSI) igniter / flame – probe assembly.
- 6) Failed microprocessor controller (computer).

### **14. No heat...igniter sparks, burner goes on and off right away ...GAS MODELS ONLY.**

- 1) Direct Spark Ignition (DSI) igniter / flame – probe out of adjustment...reposition closer to the flame area.
- 2) Sail switch is fluttering.
  - a. Lint drawer / screen are dirty.
  - b. Restriction in the exhaust duct work.
- 3) Insufficient make – up air.
- 4) Failed Direct Spark Ignition (DSI) igniter / flame – probe assembly.
- 5) Failed Direct Spark Ignition (DSI) module (burner control).
- 6) Failed gas valve.

### **15. No heat ...STEAM MODELS ONLY.**

- 1) Fault in lint chamber sensor bracket hi – heat (limit) protector thermostat.
- 2) Failed microprocessor controller (computer).
- 3) No (external) compressed air to steam damper...80 Psi required.

## **TROUBLE SHOOTING**

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- 4) Failed steam damper 24 VAC pneumatic solenoid switch.
- 5) Failed steam damper piston.
- 6) Steam damper stuck closed.
- 7) Air flow control valve restricting incoming compressed air.

### **16. No heat...ELECTRIC MODELS ONLY.**

- 1) Fault in sail switch circuit.
  - a. Sail switch out of adjustment and / or faulty (failed).
  - b. Sail switch not closing or fluttering
    - Check impeller (fan / blower) motor and rotation direction.
    - Restrictions in the location exhaust system.
- 2) Failed oven hi – limit.
- 3) Failed lint compartment automatic (200°) safety thermostat.
- 4) Failed oven contractor (relay).
- 5) Failed microprocessor controller (computer).

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

- 1) Exhaust duct work run too long or is undersized...back pressure **cannot** exceed 0.3 inches W.C.
- 2) Restriction in exhaust.
  - a. Customer furnished exhaust back draft damper is sticking partially closed.
  - b. Restriction in the duct work...check duct work from dryer all the way to the outdoors.
- 3) Low and / or inconsistent gas pressure (for **GAS MODELS ONLY**).
- 4) Insufficient make – up air.
- 5) Poor air / gas mixture at burner...yellow or poor flame pattern. Adjust gas burner air adjustment shutters (for **GAS MODELS ONLY**).
- 6) Lint drawer / screen not being cleaned on a regular basis or often enough.
- 7) Extractors (washers) not performing properly.
- 8) Sail switch is fluttering...restriction in exhaust (for **GAS MODELS ONLY**).
- 9) Failed microprocessor controller (computer)...temperature calibration is inaccurate.
- 10) Failed microprocessor temperature sensor calibration is inaccurate.
- 11) Failed burner hi – limit (for **GAS MODELS ONLY**).
- 12) Failed lint chamber hi-heat protector thermostat.
- 13) Steam damper system not functioning properly (for **STEAM MODELS ONLY**).
  - a. Steam damper sticking closed.
  - b. Leak in the pneumatic system.
  - c. Flow control incorrectly set.



## **TROUBLE SHOOTING**

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### **18. Condensation on main door glass.**

- 1) Too long, undersized, or improperly installed duct work.
- 2) Dryer connected to common exhaust duct with another dryer and no back draft damper was installed in customer furnished duct work.
- 3) Customer furnished back draft damper in duct work is sticking in partially closed position.

### **19. Dryer or scraping noises at basket (tumbler) area.**

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

### **20. Excessive noise and / or vibration.**

- 1) Dryer not leveled properly.
- 2) Impeller (fan / blower) out of balance.
  - a. Excessive lint builds up on impeller (fan / blower).
  - b. Failed impeller (fan / blower).
- 3) Loose basket (tumbler) tie rod.
- 4) Baskets (tumbler) out of adjustment or adjustment bolts (hardware) are loose.
- 5) Failed basket (tumbler.) support.
- 6) Loose motor mount.
- 7) Failed idler and / or tumbler bearings.
- 8) V – belts either too tight or too loose.

## **B. TIMER MODELS**

### **1. Dryer will not start...both drive and blower motors are not operating (indicator light is off).**

- 1) Dryer control circuit fuse is blown.
- 2) Open at location.
  - a. Service main fuse or circuit breaker.
- 3) Failed push to start relay.
- 4) Failed door switch and / or circuit.
- 5) Failed heat timer.
- 6) Failed dual timer relay.

## **TROUBLE SHOOTING**

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### **2. Drive motor (only) not operating (does not start).**

- 1) Failed drive motor contractor (relay).
- 2) Failed reversing timer.
- 3) Failed drive motor.

### **3. Blower (impeller / fan) motor (only) not operating (does not start).**

- 1) Tripped or failed overload.
- 2) Failed impeller (blower / fan) motor contractor (relay).
- 3) Failed reversing timer.
- 4) Failed blower (impeller / fan) motor.

### **4. Both drive motor and blower (impeller / fan) motor not operating (do not start) and indicator light is on.**

- 1) Fault in L1 termination at reversing timer.

### **5. Drive motor (reversing) operates in one direction only...stops and restarts in same direction.**

- 1) Failed reversing contractor (relay).
- 2) Failed reversing timer.

### **6. Heating unit is not operating (no heat)...no voltage at heating unit (i.e., Gas Model DSI module or Steam Model damper system pneumatic solenoid).**

#### **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.
    - Check blower (impeller / fan) motor and rotation direction.
    - Restriction in exhaust.
    - Lint drawer / screen are dirty.
- 2) Failed burner hi – limit switch.
- 3) Failed lint compartment automatic (200°) safety thermostat circuit.
- 4) Failed Direct Spark Ignition (DSI) module (burner control).
- 5) Failed Direct Spark Ignition (DSI) igniter / flame – probe assembly.
- 6) Failed heat selector switch.

#### **Electric Models:**

- 1) Fault in sail switch circuit.
  - a. Sail switch is out of adjustment or has failed.
  - b. Sail switch is not closing or is fluttering.
    - Check blower (impeller / fan) motor and rotation direction.
    - Restriction in exhaust.
- 2) Failed oven hi – limit circuit.

## **TROUBLE SHOOTING**

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- 3) Failed lint compartment automatic (200°) safety thermostat circuit.
- 4) Failed oven contractor (relay).
- 5) Failed heat selector switch.

### **Steam Models:**

- 1) Steam dampers binding and / or stuck.
- 2) No (external) compressed air to the steam damper...80 Psi required.
- 3) Failed lint compartment automatic (200°) safety thermostat circuit.
- 4) Failed steam damper 24 VAC pneumatic solenoid switch.
- 5) Air flow control valve restricting incoming compressed air.
- 6) Fail heat selector switch.
- 7) Failed steam damper piston.

### **7. Heat unit not operating for only one (1) temperature selection.**

- 1) Failed thermostat corresponding to selection made.
- 2) Failed heat selector switch.

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

- 1) Heating unit is cycling on hi – limit thermostat (for **GAS MODELS and ELECTRIC MODELS ONLY**).
- 2) Steam damper is binding partially in the open position (for **STEAM MODELS ONLY**).
- 3) Lint and / or dust accumulation on steam coil fins (for **STEAM MODELS ONLY**).
- 4) Housekeeping.
  - a. Lint screen and lint compartment not being cleaned on a regular basis.
  - b. Lint accumulations in location exhaust system.
- 5) Insufficient make – up air.
- 6) Failed hi – limit thermostat (for **GAS MODELS and ELECTRIC MODELS ONLY**).
- 7) Failed lint compartment automatic (200°) safety thermostat circuit.
- 8) Extractors not performing properly.
- 9) Low and / or inconsistent gas pressure (for **GAS MODELS ONLY**).
- 10) Gas supply may have low heating value (for **GAS MODELS ONLY**).
- 11) Sail switch is fluttering (for **GAS MODELS and ELECTRIC MODELS ONLY**). Restrictions in location exhaust system.
- 12) Fault in electric oven element circuit (for **ELECTRIC MODELS ONLY**).
  - a. Failed element(s).
  - b. Failed oven contractor.
- 13) Exceptionally cold / humid or low barometric pressures atmosphere.
- 14) Blower (impeller / fan) motor rotation direction incorrect.

### **9. Dryer is cycling on hi – limit thermostat (GAS MODELS and ELECTRIC MODELS ONLY).**

- 1) Blower (impeller / fan) motor rotation direction incorrect.
- 2) Insufficient make – up air.
- 3) Restriction in exhaust system.
  - a. Undersized exhaust ducting.
- 4) Lint screen needs cleaning.
- 5) Failed hi – limit thermostat.
- 6) Failed oven contractor / relay (for **ELECTRIC MODELS ONLY**).

### **10. Condensation on main door glass.**

- 1) Too long, undersized, or improperly installed duct work.
- 2) Dryer connected to common exhaust duct with another dryer, and no back draft damper was installed in customer – furnished duct work.
- 3) Location furnished back draft damper in duct work is sticking in partially closed position.

### **11. Dryer scraping noise at basket (tumbler) area.**

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

### **12. Excessive noise and / or vibration.**

- 1) Dryer is not leveled properly.
- 2) Impeller (fan / blower) is out of balance.
  - a. Excessive lint builds – up impeller (fan / blower).
  - b. Failed impeller (fan / blower).
- 3) Loose basket (tumbler) tie rod.
- 4) Baskets (tumbler) out of adjustment or adjustment bolts (hardware) are loose.
- 5) Failed basket (tumbler) support.
- 6) Loose motor mount.
- 7) Failed idler bearings or tumbler (basket) bearings.
- 8) V – Belts too loose or too tight.

## **SECTION 8**

### **SERVICE/PART INFORMATION**

#### **A. SERVICE**

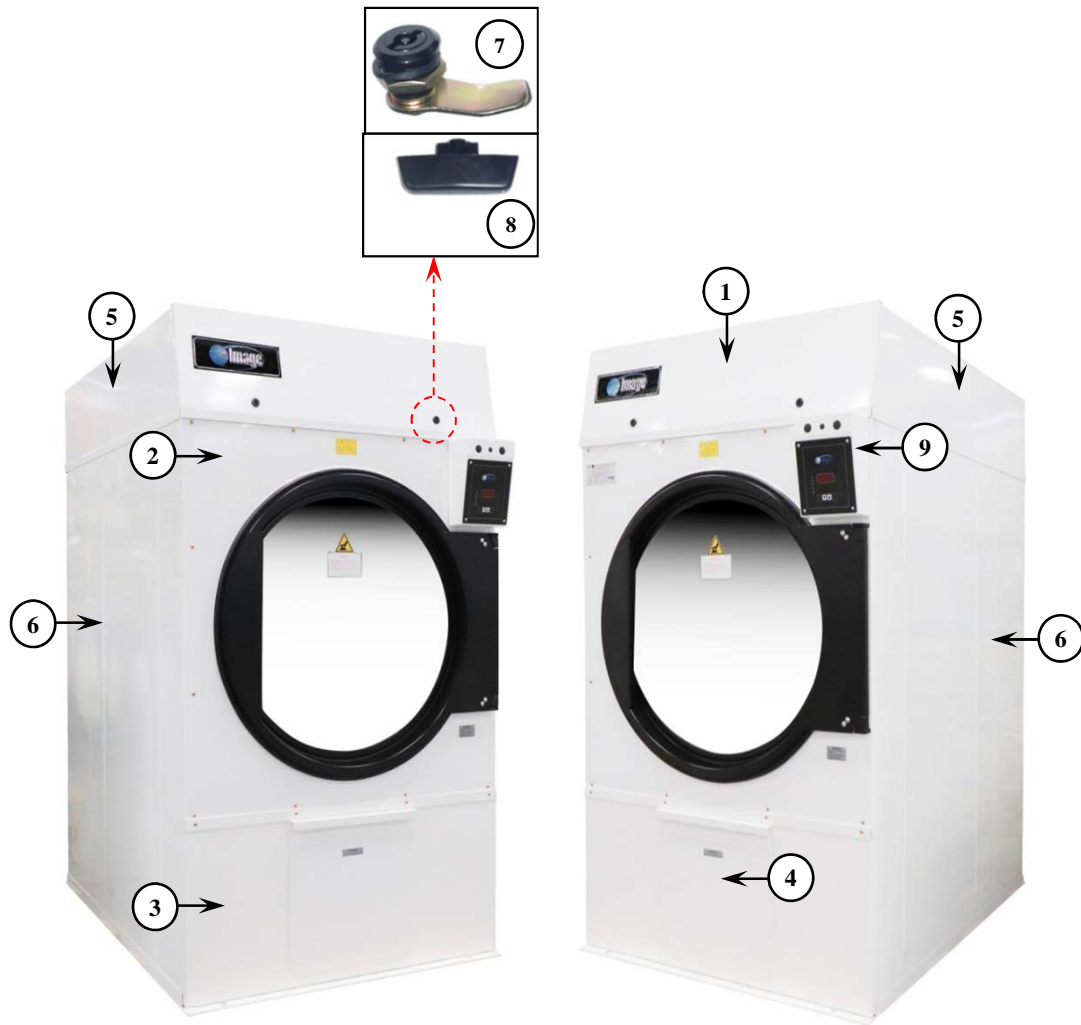
Service **must be** performed by a qualified trained technician, service agency, or gas supplier. If service is required, contact the distributor from whom the dryer equipment was purchased. If the distributor cannot be contacted or is unknown, contact the Dryer Service Department for a distributor in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

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

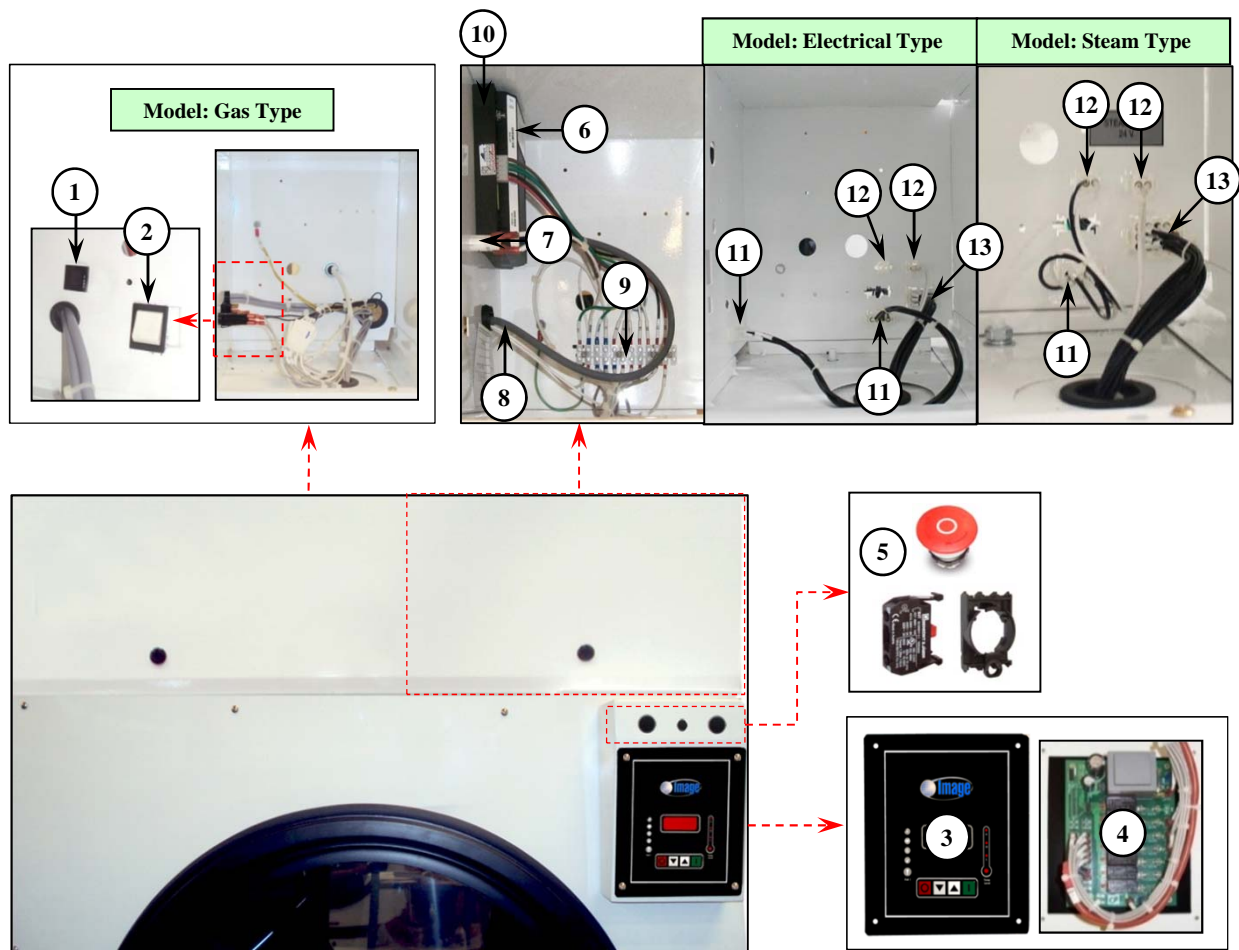
#### **B. PARTS LIST**

Replacement parts **should be** purchased from the distributor from whom the dryer equipment was purchased. If the distributor cannot be contacted or is unknown, contact the Dryer Parts Department for a distributor in your area. Parts may also be purchased directly from the factory.

**NOTE:** When ordering replacement parts from the dryer dealer or dryer 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.



Item	Part No.	Qty.	Description
1	A2-S120-001	1	Front panel assembly, Top
2	A2-SDE1-216	1	Front panel assembly, Middle
3	A2-S120-003	1	Front panel assembly, Lower
4	A2-S100-001	1	Door lint drawer filter
5	A2-S100-005	1	Cabinet Assembly, Top (Electric)
	A2-S100-022	1	Cabinet Assembly, Top (Steam)
	A2-S100-023	1	Cabinet Assembly, Top (Gas)
6	A2-S100-008	1	Cabinet Assembly, Lower
7	A0-A013-010	2	Master key
8	A0-A013-011	2	Key
9	A2-SDE1-106	1	External mounting panel

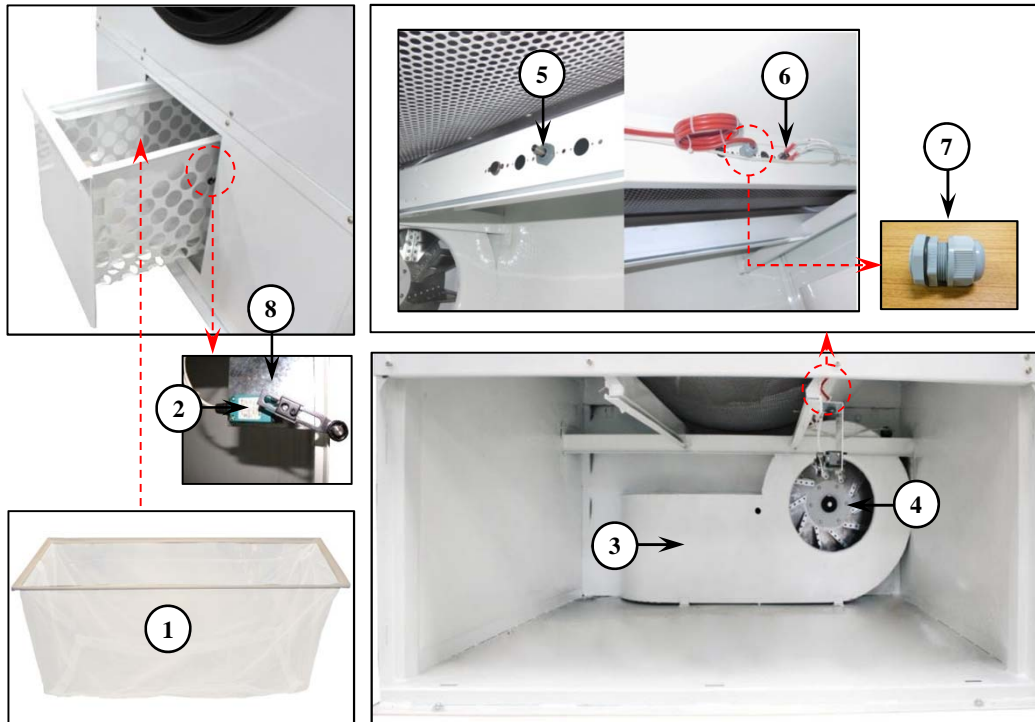


Item	Part No.	Qty.	Description
1	A0-E010-035	1	Circuit breaker 2A.
2	A0-E033-009	1	Switch ON-OFF
3	A0-A090-112	1	Sticker DE01
4	A0-E031-050	1	DE01 Board Timer Digital
5	A0-E032-022	1	Emergency Stop Button, Turn To Release, Metal Ring
	A0-E032-023	1	Connector Base, E-Stop
	A0-E032-024	1	Contact Block, N.C, E-Stop
6	A0-E020-001	1	Ignition control 24V, 50/60HZ, 0.25A
7	A0-E059-005-01	1	Lamp, indicator
8	A0-E019-012	1	Wire, suppression
9	A0-E021-039	1	Terminal block
10	A0-E020-203	1	Wires harness cable 5 pins 30 cm
11	A0-E055-053	1	Connector Housing Male 4 Pos
	A0-E055-054	1	Connector Housing Female 4 Pos
12	A0-E055-051	1	Connector Housing Male 2 Pos
	A0-E055-052	1	Connector Housing Femal 2 Pos
13	A0-E055-006	1	Connector Housing Male 15 Pos
	A0-E055-007	1	Connector Housing Female 15 Pos

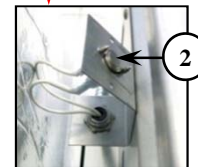
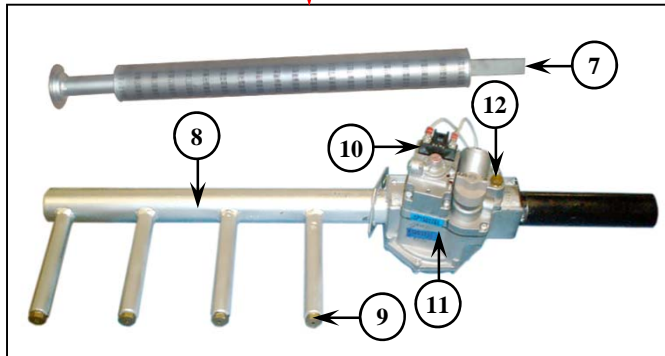
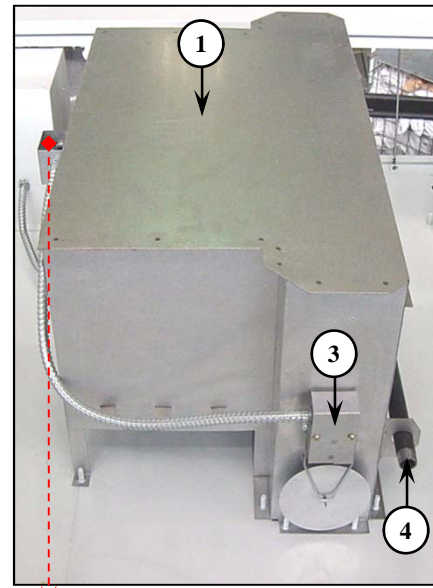
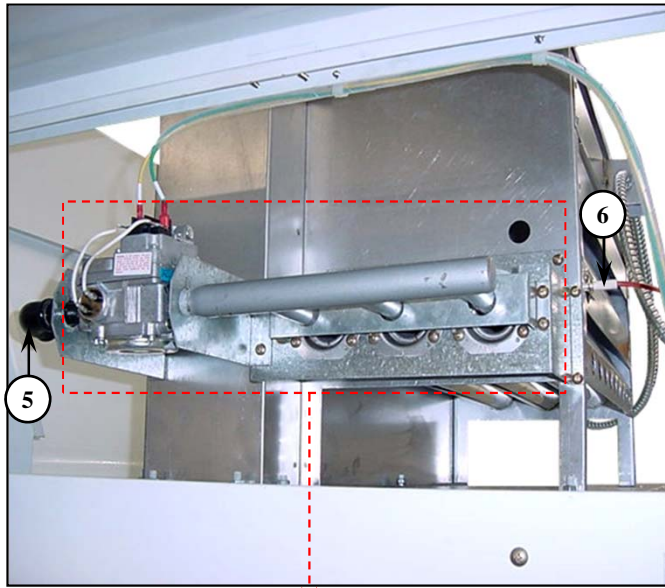


Item	Part No.	Qty.	Description
1	A2-SDE1-212	1	Hinge and hinge shaft
2	A2-SDE1-213	1	Door ring
3	A2-SDE1-214	1	Door ring include door glass
4	A2-SDE1-215	1	Door handle
5	A0-E015-017	1	Door switch
	A2-SDE1-182	1	Door switch box
6	A0-A036-004	2	Magnet catch
	A2-SDE1-036	2	Magnet Latch Bracket
7	A0-A001-048-04	1	Door Seal Gasket
8	A0-A003-011	1	Door glass
9	A2-S100-025	1	Basket galvanized sheet
	A2-S100-026	1	Basket stainless steel sheet
10	A0-A029-019	1	Door hinge blue lower (Left and Right side)
11	A0-A029-020	1	Door hinge blue Upper (Left and Right side)

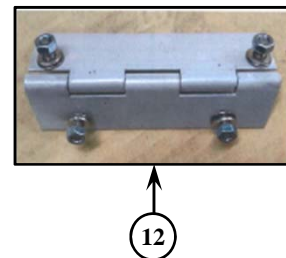
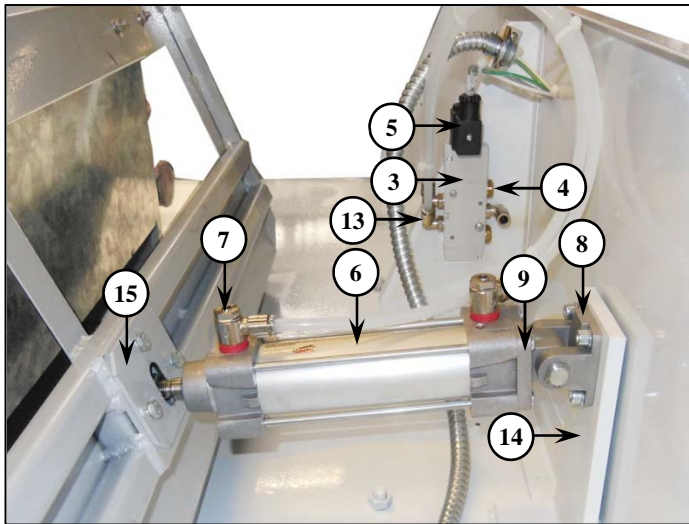
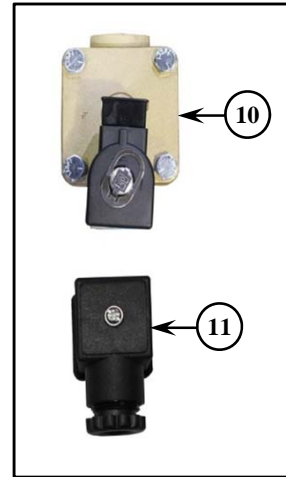
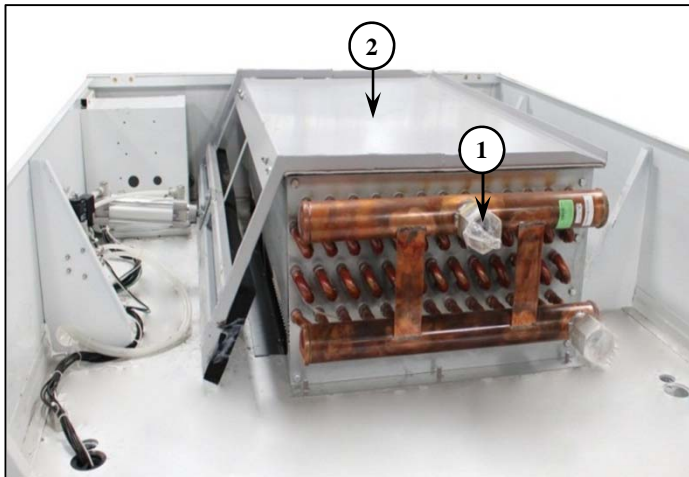




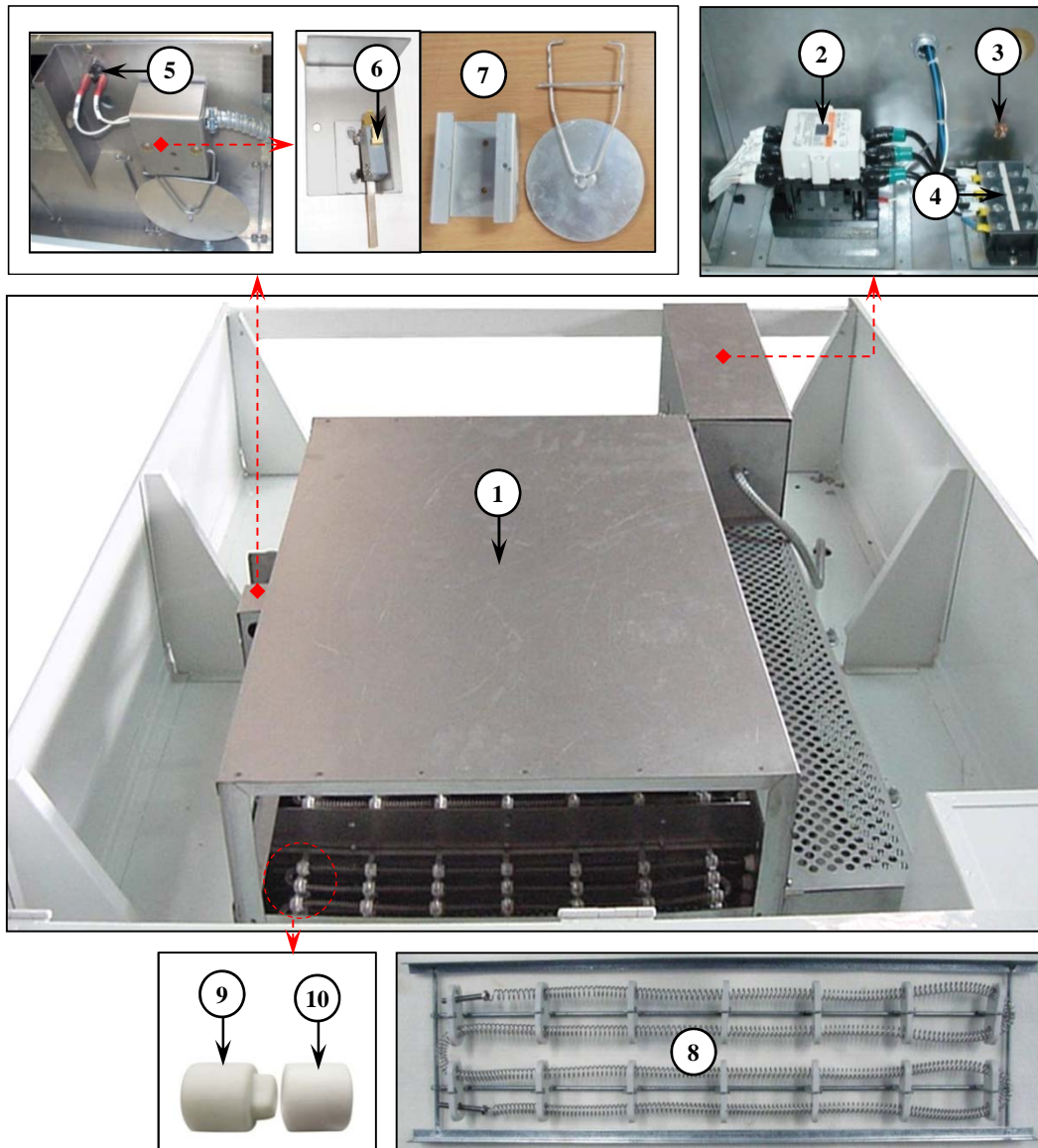
Item	Part No.	Qty.	Description
1	A0-X025-102-04	1	Lint filter
2	A0-E011-033	1	Limit Switch
3	A2-S120-021	1	Fan side plate
4	A0-M003-005	1	Wheel suction fan
	A0-M008-119	1	Blower pulley
5	A0-E027-065	1	Temp Probe, 3.5 m, For DE01
6	A0-E016-011	1	Thermostat L-200 F
7	A0-A028-001	1	Cable Gland + Lock Nut
8	A2-SDE1-120	1	Plate Support Limit switch



Item	Part No.	Qty.	Description
1	A0-A027-004	1	Burner gas
2	A0-E016-013	1	Thermostat
3	A2-SDE1-028	1	Cabinet Sail Switch Complete Shell
	A0-E014-014	1	Micro switch
4	A2-S120-036	1	Pipe, Gas inlet
5	A0-A009-013	1	Nipple 3/4"
6	A0-E019-011	1	Spark probe
	A0-E019-012	1	Wire, Suppression
7	A0-A089-009	3	Gas burner tube (SUS)
8	A2-SDE1-169	1	Monifold, Gas 3/4", 3 Hole (LPG)
	A2-SDE1-170	1	Monifold, Gas 1", 3 Hole (NG)
9	A0-A105-023	3	Nozzles gas LP Gas brass 1/4" Hole 3mm.
	A0-A105-024	3	Nozzles gas NGas brass 1/4" Hole 4mm.
10	A0-E018-010	1	Pressure regulator (LPG)
11	A0-E018-009-1	1	Gas valve 3/4" (LP Gas)
	A0-E018-003	1	Gas valve 1" (Natural Gas)
12	A0-A105-029	1	Plugs Brass Hexagon

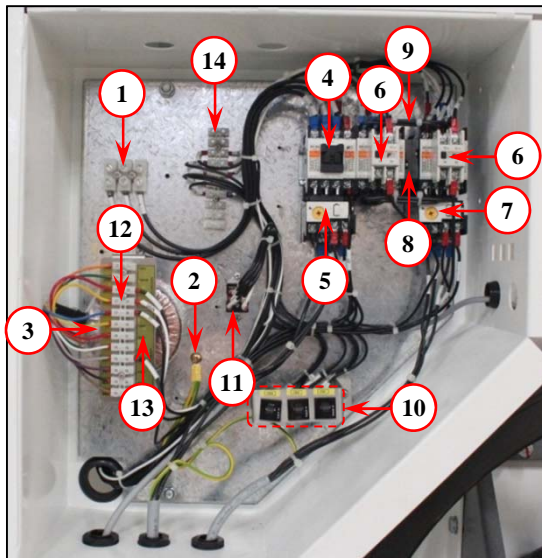


Item	Part No.	Qty.	Description
1	A0-A026-004	1	Steam coil
2	A2-S120-051	1	Steam damper
3	A0-P005-203	1	Solenoid Valve
4	A0-P006-018	2	Silencer 1/4
5	A0-P005-180	1	Coil, Air Solenoid Valve
	A0-P005-181	1	Coil Connector
6	A0-P003-117	1	Air Cylinder
7	A0-P009-003	2	Flow reducer Unidirectional
8	A0-A015-007	1	Male-Hinge
9	A0-A015-006	1	Female-Hinge
10	A0-E047-006	1	Solenoid Steam Valve 1"
11	A0-E056-001	1	Plug Connector
12	A2-SDE1-155	2	Hinge for Damper
13	A0-P006-004	3	Push in Fitting-Swivel Elbow
14	A2-SDE1-127	1	Mounting support Male-Hing of Air cylinder
15	A2-SDE1-245	1	Mounting Support Steam Damper with Air cylinder

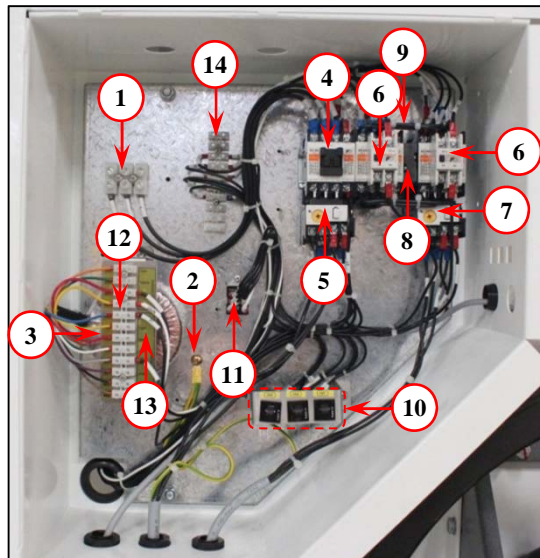


Item	Part No.	Qty.	Description
1	A0-E013-006	1	Heater box complete assembly (Heater)
2	A0-E004-078	1	Magnetic Contactor
3	A0-E055-001	1	Connector, Ground lug
4	A0-E021-142	1	Terminal
5	A0-E016-013	1	Thermostat
6	A0-E014-014	1	Micro switch (Std)
7	A2-SDE1-028	1	Cabinet sail switch shell
8	A0-E005-009	18	Heating Element , 4000W
9	A0-A094-001	36	Male Ceramic
10	A0-A094-002	36	Female Ceramic

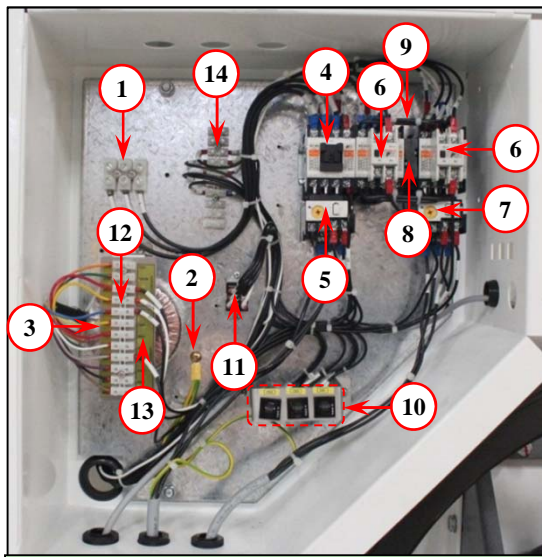




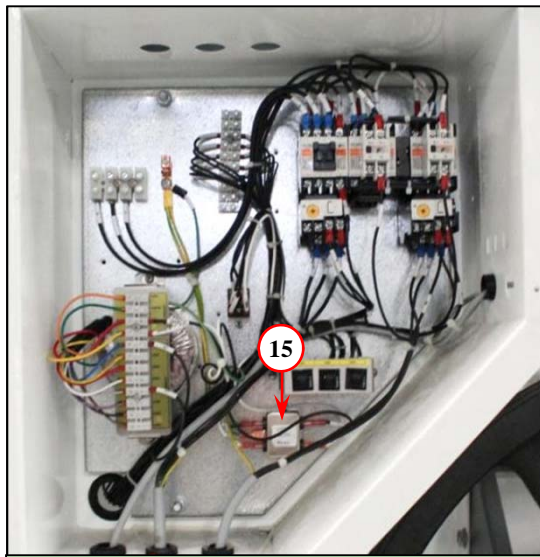
Model: Electrical Control Unit -Heating Type



Model: Electrical Control Unit -Steam Type



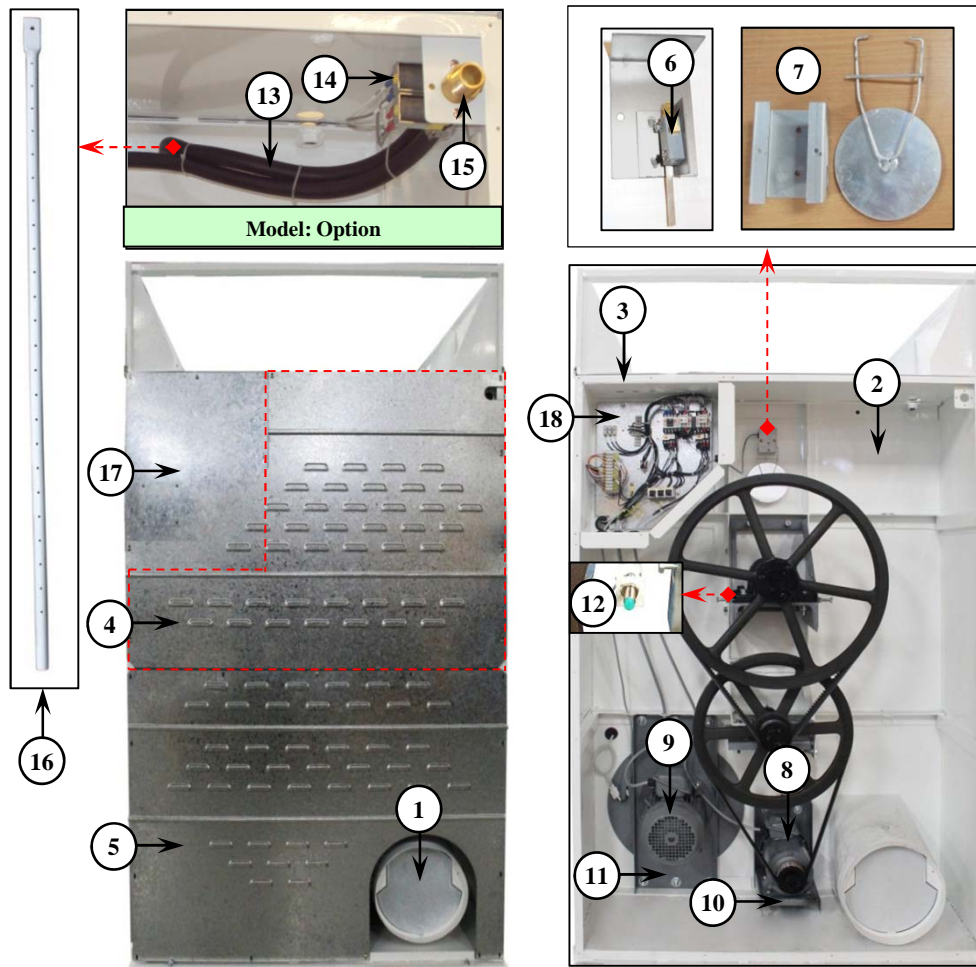
Model: Electrical Control Unit-Gas Type



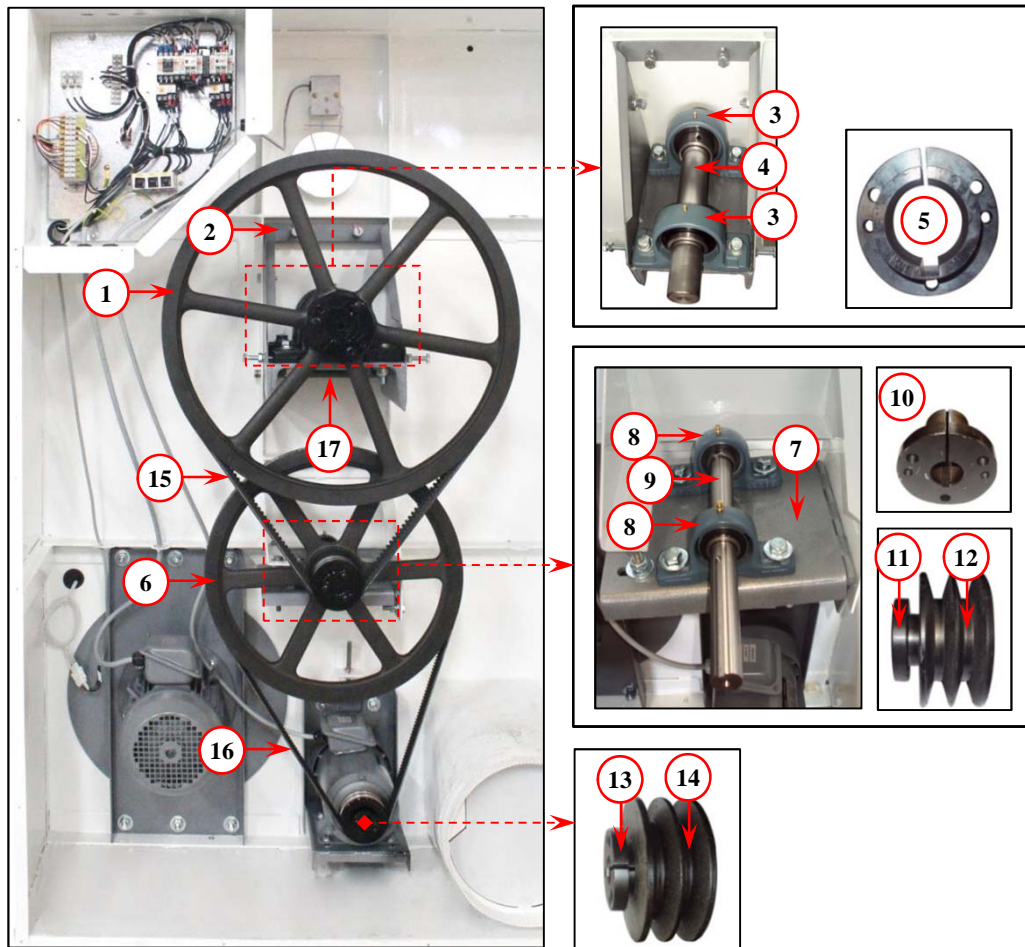
Model: Option

Item	Part No.	Qty.	Description
1	A0-E021-031/1	1	Terminal block 3 pole
2	A0-E055-001	1	Connector, Ground lug
3	A0-E006-073	1	Transformer (Gas, Steam Type)
	A0-E006-074	1	Transformer (Electric Type)
4	A0-E004-065	1	Magnetic contractor-Blower (SC-03 Coil 24VAC.)
5	A0-E025-056	1	Over load-Blower (200-240V)
	A0-E025-054	1	Over load-Blower (380-440V)
6	A0-E004-065	2	Magnetic contractor-Blower (SC-03 Coil 24VAC.)
	A0-E024-011	2	Auxiliary contact
7	A0-E025-053	1	Over load-Basket (200-240V)
	A0-E025-052	1	Over load-Basket (380-440V)

Item	Part No.	Qty.	Description
8	A0-E036-006	1	Mechanical interlock
9	A0-E036-007	1	Power connection kit for reversing
10	A0-E010-035	2	Circuit breaker 2A. (Gas, Electric, Steam Type)
	A0-E010-034	1	Circuit breaker 3A. (Gas, Steam Type)
	A0-E010-029	1	Circuit breaker 6A. (Electric Type)
11	A0-E009-017	1	Relay 24VAC 50/60HZ.
12	A0-E021-039	1	Terminal block 10POS
13	A0-A090-130	1	Decal For Transformer Terminal Block
14	A0-E021-039	1	Terminal block 10POS
15	A0-E003-026	1	EMI Filter



Item	Part No.	Qty.	Description
1	A2-S120-012	1	Exhaust duct outlet
2	A2-S120-015	1	Rear panel assembly
3	A2-S120-101	1	Electrical box
4	A2-S120-104	1	Back guard (Upper)
5	A2-S120-105	1	Back guard (Lower)
6	A0-E014-014	1	Micro switch (Standard)
7	A2-SDE1-027	1	Cabinet sail switch shell
8	A0-E008-873	1	Basket motor 1 HP. /4 P. 50/60HZ./3 PH
9	A0-E008-874	1	Blower motor 3 HP. /4 P. 50/60HZ./3PH.
10	A2-S120-031	1	Basket motor mounting plate
11	A2-S120-032	1	Suction fan Motor mounting plate
12	A0-E023-009	1	Proximity sensor (Option)
13	A0-A018-016	2	Hose, Water supply flush hose, 1/2" (Option)
14	A0-E040-023	1	Supply valve 2 way 3/4" (Option)
15	A0-A011-091	1	Nipple, Female-Male 3/4" (Option)
16	A2-S120-084	2	Water Tube (For Fire Protection)
17	A2-S120-103	1	Cover Electrical box
18	A2-S120-108	1	Plate for Support Electrical Equipment



Item	Part No.	Qty.	Description
1	A0-M008-033	1	Basket Pulley
2	A2-S120-022	1	Bearing mount, Top
3	A0-A004-274	2	Bearing block unit+ housing M16
4	A2-S120-024	1	Basket shaft
5	A0-M009-034	1	Basket pulley bushing
6	A0-M008-032	1	Idler pulley
7	A2-S120-023	1	Bearing mount, Lower
8	A0-A004-276	2	Idler Shaft Bearing
9	A2-S120-025	1	Idler Shaft
10	A0-M009-037	1	Idler pulley bushing
11	A0-M009-035	1	Idler sheave bushing
12	A0-M008-030	1	Idler sheave
13	A0-M009-036	1	Motor sheave bushing
14	A0-M008-031	1	Motor sheave (For 60Hz.)
	A0-M008-094	1	Motor sheave (For 50Hz.)
15	A0-A002-710	2	V-Belt
16	A0-A002-215	2	V-Belt
17	A2-SDE1-116	1	Support Base Shaft



# INSTALLATION DATA

## 700 SERIES

### GAS HEATING CONTROLS

The 700 Series gas controls are designed for a wide variety of heating applications. Models are available for: Manual, Millivolt, Hydraulic, 24 Volt and Line Voltage. Models are available with and without a pressure regulator. A field-addable pressure regulator is also available separately. (NOTE: The Pressure regulator is "built-in" on hydraulic models and requires replacement of the operator assembly when converting from one gas to another. Controls are multiposition and can be mounted in any position (except upside-down).

#### SPECIFICATIONS

##### ELECTRICAL RATINGS

24 Volt Models

12 VDC - 0.18 amps

24 VDC - 0.2 amps

Millivolt models

250 MV to 750 MV

Line Voltage Models

120 VAC - .034 amps

240 VAC - .017 amps

##### CONTROL VOLTAGE IDENTIFICATION - WIRING BLOCK



##### PRESSURE REGULATOR (Optional by Model)

Natural Gas

Factory set at 3.5" W.C.

L.P. Gas

Factory set at 11.0" W.C.

##### TEMP. RANGE (Hydraulic Models Only)

##### DIAL EQUIVALENTS (Hydraulic Models Only)

###### Standard Dial Type

Dial Position	1	2	3	4	5	6	7	8	HI
Temperature °F	58°	62°	66°	70°	74°	78°	82°	86°	90°

###### Remote Dial Type

Dial Position	Low	Med.	High
Temperature °F	50°	70°	90°

##### CAPILLARY LENGTH (Hydraulic Models Only)

Single capillary type

36"

Remote dial type

Combination 18" & 48"

##### RULB O.D. & LENGTH (Hydraulic Models Only)

1/4" x 8"

##### PILOT OUTLET

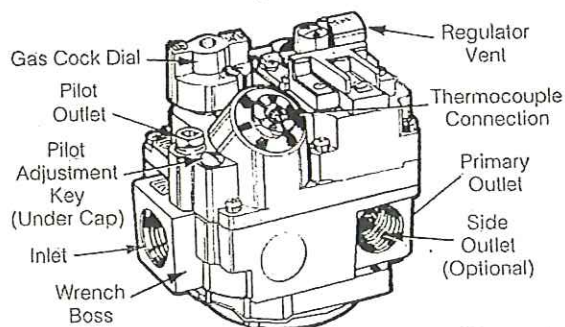
1/4" Tubing

##### AMBIENT TEMPERATURE

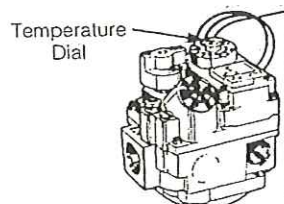
-40° to 175°F

##### MAXIMUM INLET PRESSURE

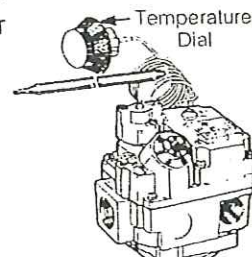
14" W.C. (1/2 PSI)



24 VOLT

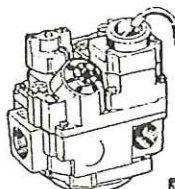


HYDRAULIC

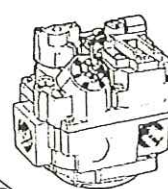


HYDRAULIC

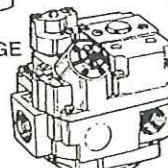
WITH  
REMOTE  
DIAL



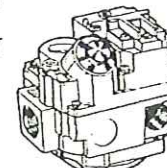
LINE VOLTAGE



MILLIVOLT



MANUAL



DIAPHRAGM  
GAS VALVE

#### CAUTION

THIS DEVICE SHOULD BE INSTALLED BY A QUALIFIED TECHNICIAN WITH DUE REGARD FOR SAFETY AS IMPROPER INSTALLATION COULD RESULT IN A HAZARDOUS CONDITION.

## INSTALLATION INSTRUCTIONS

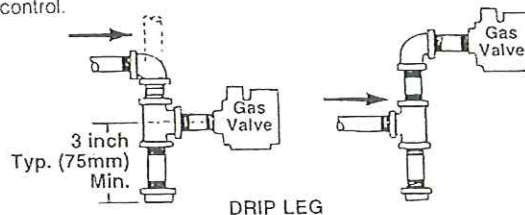
Turn off gas supply and electrical power to equipment before servicing.

### PIPING

1. Check replacement valve for multiple outlets (side outlets). If it has them, be sure all unused outlets are plugged using the socket plugs provided.
2. Pipe or tubing must be clean and free of scale and dirt.
3. Make sure gas piping is pressure tested before control is connected. High pressure can damage control causing a hazardous condition. Do not subject control to more than 1/2 PSI, (14" W.C.) inlet pressure.
4. If it is not already installed, a drip leg (sediment trap) must be added to the gas supply line to the control. (See figure to the right.) All piping must comply with local codes and ordinances and with National Fuel Gas Code (ANSI Z223.1 / NFPA, No. 54).
5. Using pipe thread compound suitable for gas being used, apply a small amount on the male pipe threads. (Do not use Teflon tape or Teflon compound.) Leave the first two threads clean. Never use

compound on female threads as it might be pushed into the control body.

6. The gas valve is multiposition and can be mounted in any position (except upside-down) without affecting its operation.
7. Install gas valve so gas flow conforms with the inlet and outlet of the control.



DRIP LEG

## INSTALLATION INSTRUCTIONS (Cont'd)

8. **DO NOT** insert any object other than suitable pipe or tubing in the inlet or outlet of this control. Internal damage may occur and result in a hazardous condition. A backup wrench should only be used on the inlet wrench boss provided for this purpose, never on body of the control, as this could distort the casting. **NOTE:** Do not overtighten any pipe connections, as this could crack the valve body. A valve with a cracked valve body will not be warrantied.

### PILOT TUBING

1. Make sure tubing is free of burrs and dirt.
2. We strongly recommend that the pilot orifice be checked and cleaned if necessary at this time.
3. Connect pilot tubing into the control using fitting provided, and tighten for a gas tight seal.

### PRESSURE REGULATOR VENT

The 700, when equipped with a pressure regulator, has as standard equipment a built-in Vent Limiter. The regulator vent is tapped 1/8" tubing if vent tubing is required. This fitting is available in a package of 15, order 4590-065. **CAUTION:** If bleed tubing is used, do not allow main burner or pilot flame impingement on the tubing as this will eventually cause clogging of the tubing and improper regulator operation. If bleed tubing is not used, the regulator vent must be properly shielded from moisture.

### THERMOCOUPLE CONNECTION

The thermocouple nut should be started and turned all the way in by hand. An additional quarter turn with a small (4") wrench will then be sufficient to set the lock washer. **CAUTION:** Overtightening may cause damage to the thermocouple or magnet and is unnecessary.

### HYDRAULIC MODELS

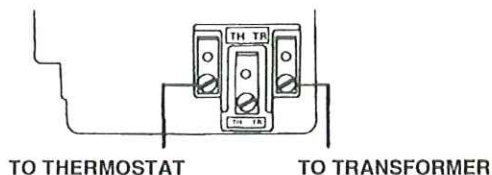
1. **NOTE:** Capillary is liquid-filled and sharp bends are to be avoided.
2. Sensing bulb positioning is important. Attach remote sensing bulb into the existing clips provided by the manufacturer of the equipment.
3. On models with dual capillary or remote dial, install remote dial unit into panel opening provided by the manufacturer.
4. For installations requiring a remote dial drive rod to operate the gas cock dial, order 1751-009 Drive Rod Adaptor Kit.

### WIRING

**DO NOT** short gas valve terminals. This will damage wall thermostat and void warranty.

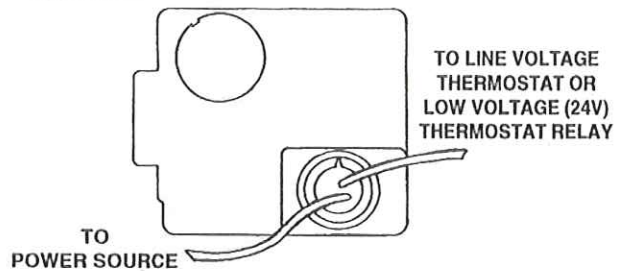
#### 24 Volt Models

1. Check the system for the proper transformer by comparing the VA ratings of the transformer and the system. The system rating is determined by multiplying the voltage draw times the amp draw. Normally 20VA transformers are sufficient for heating only applications and 40VA for heating / cooling applications.
2. Connect lead from transformer to "TR" terminal on gas valve operator - see drawing.
3. Connect lead to wall thermostat to "TH" terminal on gas valve operator - see drawing.



#### Line Voltage Models

1. Check old gas valve or appliance. Determine operating voltage for gas valve 120 VAC or 240 VAC (see front page).
2. Make sure replacement gas valve is the correct voltage to match application.



#### Millivolt Models

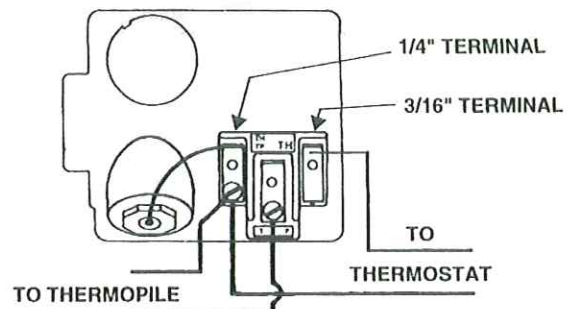
Most appliances manufactured in the USA and Canada are manufactured to meet the standards set forth by the American National Standards Institute (ANSI). A recent revision in the standards "mis-wiring requirements for gas valves" was effective January 1, 1996. The reason for this standard was so that you as a service technician could disconnect the gas valve wires and reconnect them without making a mistake. Therefore all Robertshaw millivolt gas valves now meet the new standard. The 700-500 series millivolt gas valves now have a 1/4" quick connect terminal and a 3/16" quick connect terminal on the terminal block. There is NO terminal screw (or threads) on the side that has the 3/16" terminal. If your old application used a terminal screw, you will need to use the 3/16" adaptor terminal that is included with this gas valve.

The 700 Series millivolt valves are designed to operate with 1950 and 1951 Series thermopiles. These valves will also operate with any competitive thermopiles having outputs of 250 MV to 750 MV.

For best operation of a millivolt system, the lead wires from the valve to the wall thermostat should not exceed the recommended maximum lengths shown below:

Wire Size	Max. Length	Wire Size	Max. Length
14 GA.	100 FT.	20 GA.	25 FT.
16 GA.	64 FT.	22 GA.	16 FT.
18 GA.	40 FT.		

#### TWO-LEAD TYPE THERMOPILE WIRING



#### LEAK TEST

Leak test with a soap solution after installing with main burner on. Coat pipe and tubing joints, gasket, etc. with soap solution. Bubbles indicate leaks.



## OPERATING INSTRUCTIONS

### WARNING

To avoid possible injury, fire and explosion, please read and follow these precautions and all instruction on appliance before lighting the pilot. L.P. (Propane) gas is heavier than air and will remain at **floor level** if there is a leak. Before lighting, sniff at **floor level**. **If you smell gas**, follow these rules:

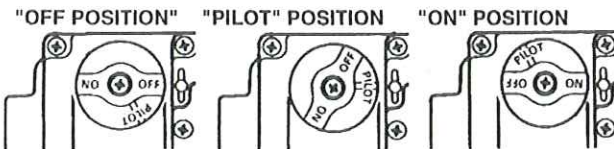
1. Get all people out of the building.
2. **DO NOT** light matches. **DO NOT** turn electric lights or switches on or off in area **DO NOT** use an electric fan to remove gas from area.
3. Shut off gas at main shutoff or L.P. tank outside of building.
4. Telephone gas company and fire department. Ask instructions.

Before hanging up, give your name, address, and phone number. **DO NOT** go back into building. If help is coming wait for them to arrive.

If L.P. tank runs out of fuel, turn off gas at the appliance. After L.P. tank is refilled, appliance must be relit according to manufacturer's instructions. If the gas control has been exposed to **WATER** in any way, **DO NOT** try to use it. It must be replaced. **DO NOT** attempt repair on gas control or appliance.

Tampering is **DANGEROUS** and voids all warranties.

1. Turn temperature dial (hydraulic models) or wall thermostat (electric models) to its lowest setting. Remove burner access panel(s).



Dials must only be operated by hand. **DO NOT** use pliers, wrenches or other tools to turn dials. The Gas Cock Dial cannot be turned to "OFF" position without first depressing dial in "PILOT" position and then rotating to "OFF".

2. Turn Gas Cock Dial to "OFF" position.
3. **WARNING:** Wait at least 5 minutes to allow any gas in the combustion chamber to vent. If you then smell gas in the appliance area or near the floor, STOP and follow warning instructions to the left. Failure to do so may result in fire or explosion.
4. If you don't smell gas, turn gas cock dial counterclockwise to the "PILOT" position.
5. Hold match at pilot burner. **WARNING:** If pilot lights without depressing gas cock dial, replace control. NOTE: This does not apply to models without a safety magnet. On these models pilot gas will flow all the time when control is in the "ON" position. Depress and hold gas cock dial while lighting pilot burner. Allow pilot to burn approximately one minute (1-1/2 minutes for millivolt models) before releasing gas cock dial. If pilot does not remain lighted, repeat operation allowing longer period before releasing gas cock dial. (Adjust pilot, if necessary, as noted under "Pilot Burner Adjustment".) The thermocouple or thermopile may also be defective and should be checked out (see "SERVICE INSTRUCTIONS".)
- WARNING:** If gas cock dial does not pop up when released replace control.
6. Refer to specific model.

### Manual Models Only

The appliance is now in operation. When heat is desired, turn gas cock dial to "ON" position. When heat is no longer required, turn gas cock dial back to "PILOT" position.

### Hydraulic Models

Turn gas cock dial to "ON" position and turn temperature dial to desired position. Allow burner to cycle on and off.

### 24 Volt and Millivolt Models

Turn gas cock dial to "ON" position and set room thermostat to desired temperature. Allow burner to cycle on and off.

7. Replace burner access panel.

## SERVICE INSTRUCTIONS

**CAUTION:** If control has been exposed to water in any way, it must be replaced. If gas valve fails to shut off, do not turn off electrical power. Turn off gas supply allowing fan or circulating pump (if so equipped) to continue running until system has cooled. Replace control.

### AUTOMATIC PILOT SYSTEM

To perform the following test, we recommend using our 900-041 test meter.

There are three major causes of pilot outage in the automatic pilot systems.

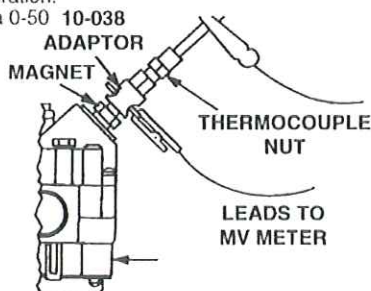
1. Improper pilot operation.
2. Low output thermocouple or thermopile.
3. Inoperative automatic pilot magnet.

Test procedures and steps to follow in checking each component of the automatic pilot systems are listed below.

#### Thermocouple Check (Except Millivolt)

A closed circuit millivolt check is used to check thermocouple output. This check is performed as follows:

1. Check for proper pilot operation.
2. Use a millivolt meter with a 0-50 millivolt range.
3. Connect Adaptor Part No. 10-038 and millivolt meter leads as shown in figure below. Be sure connections are snug.



4. Follow standard lighting procedure.
5. Check closed circuit thermocouple output. If less than eight millivolts, replace with 1970 or 1980 thermocouple.
6. Repeat standard lighting procedure after thermocouple replacement.

#### Automatic Pilot Magnet Check (Thermocouple Type)

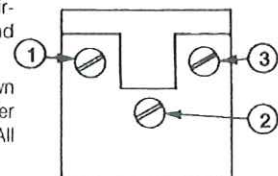
If the closed circuit check shows thermocouple output is greater than eight millivolts and pilot will not remain lit when reset button is released after initial lighting procedure, check operation of pilot magnet as follows:

1. Adaptor Part No. 10-038 should remain connected in system as shown in figure to left.
2. Follow standard lighting procedure and continue holding reset button down.
3. Allow thermocouple output to stabilize and note meter reading.
4. Extinguish pilot by releasing reset button and turning GAS COCK DIAL to "OFF" position.
5. A good magnet should remain locked up for a drop of five millivolts or more from the original stabilized reading before releasing.
6. If magnet does not operate properly, replace the valve.

#### Millivolt System

The millivolt system and individual components may be checked with a millivolt meter having a 0-1000 MV range. Before checking system, be certain wall thermostat lead wire does not exceed length recommended in Wiring Section under "Millivolt Models" and all connections are clean and tight.

Conduct each check shown in chart shown on top of next page by connecting meter test leads to terminals as indicated. All readings are closed circuit.





## SERVICE INSTRUCTIONS (Cont'd)

COMPONENT CHECK	CONNECT METER TEST LEADS TO TERMINALS	WALL THERMOSTAT CONTACTS SHOULD BE	METER READING SHOULD BE	SEE CHECK RESULT BELOW
Valve Operator System	2 & 3	Closed	Greater Than 100 MV	A
Wall Thermostat	1 & 3	Closed	Less Than 80 MV	C
Thermopile and Magnet	1 & 2	Open	Greater Than 325 MV	B

### A. TEST RESULTS

If the reading is more than 100 millivolts and the automatic valve does not come on, replace the valve operator. If the closed circuit reading is less than 100 millivolts, determine the cause by proceeding with steps "B" and "C".

### B. TEST RESULTS

If "B" reading is less 325 MV, clean and tighten all electrical connections and adjust pilot if necessary to increase millivolt output. If unable to adjust to at least the specified minimum, change the thermopile. When proper thermopile output is obtained, the magnet may then be checked. With pilot operation, allow meter reading to stabilize. Extinguish pilot burner and note meter reading at dropout point of magnet. If magnet remains locked up to a reading of 120 MV or less, the magnet is good.

### C. TEST RESULTS

If "C" reading is more than that specified for the system being checked, clean and tighten thermostat leads and connections, shorten lead wires if possible or use heavier gauge wire. Rapidly cycle thermostat to clean contacts, or change the thermostat.

### PILOT BURNER ADJUSTMENT

1. Remove pilot adjustment cap.
2. Adjust pilot key to provide properly sized flame on the thermocouple or thermopile. The flame should cover the upper 3/8" of the tip.
3. Replace pilot adjustment cap.

**IMPORTANT: Do not use GAS COCK DIAL to adjust gas output on 7000 models.**

### PRESSURE REGULATOR ADJUSTMENTS

Adjustment of the pressure regulator is not normally necessary since it is preset at the factory. However, field adjustment may be accomplished as follows:

**NOTE:** Manometer attachment may be accomplished at pressure tap plug, below control outlet.

#### Manual and Electric Models

1. Remove regulator adjustment screw cap. (Top of regulator.)
2. With small screwdriver, rotate adjustment screw "clockwise" to increase, or "counterclockwise" to decrease pressure.]
3. Replace regulator adjustment screw cap.

#### Hydraulic Models

Hydraulic models (if regulated) have a built-in pressure regulator and no adjustments can be made.

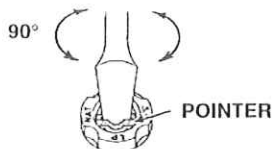
### REGULATOR CONVERSION OR REPLACEMENT

**CAUTION:** Main burner and pilot orifices must be changed when regulator is converted from one type gas to another.

#### Convertible Regulator Models

700 models with convertible regulators may be converted from Natural gas operation to L.P. gas operation or L.P. gas operation to Natural gas operation.

1. Insert a wide screwdriver blade in slot in converter pointer.
2. Rotate pointer 90° to convert regulator from Natural to L.P. gas operation or L.P. to natural gas operation. The pointer indicates the type gas and pressure at which the converter is set.

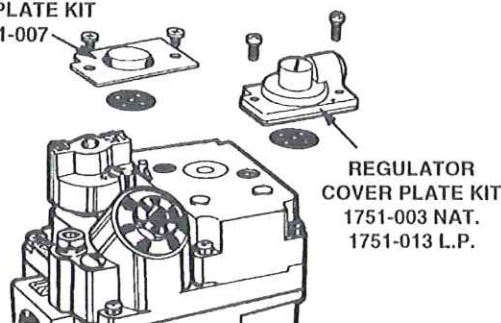


## REGULATOR REPLACEMENT

Hydraulic models do not have a replaceable pressure regulator. If it is necessary to change to another gas then the valve operator will need to be changed.

### REGULATOR COVER PLATE KIT

1751-007

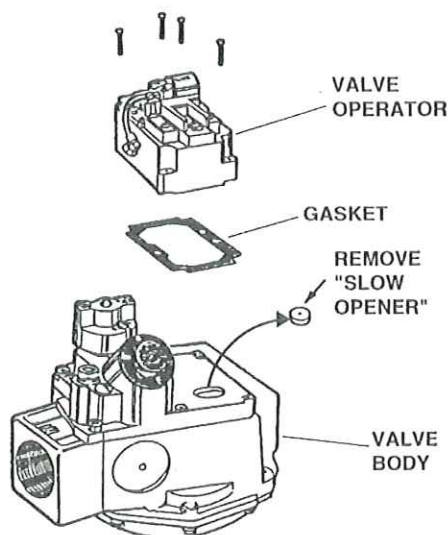


1. Depress and turn gas cock dial to "OFF".
2. Remove two screws, regulator cartridge and gasket.
3. Install new gasket and regulator (this assembly must be positioned properly). Use new screws supplied with regulator.
4. Relight appliance by following steps 4, 5 and 6 of procedure for lighting and relighting.
5. Test for leaks around the regulator using soap solution with main burner "ON".

### SLOW OPENING FEATURE

If the replacement unit has a "slow opener" it will be indicated in the factory model number by -S7A, -S7B or -S7C. Example: 7000BER-S7C. If original control **DID NOT** have a slow opening feature and after installation of replacement control you encounter ignition problems, the "slow opener" can be removed. Proceed as follows:

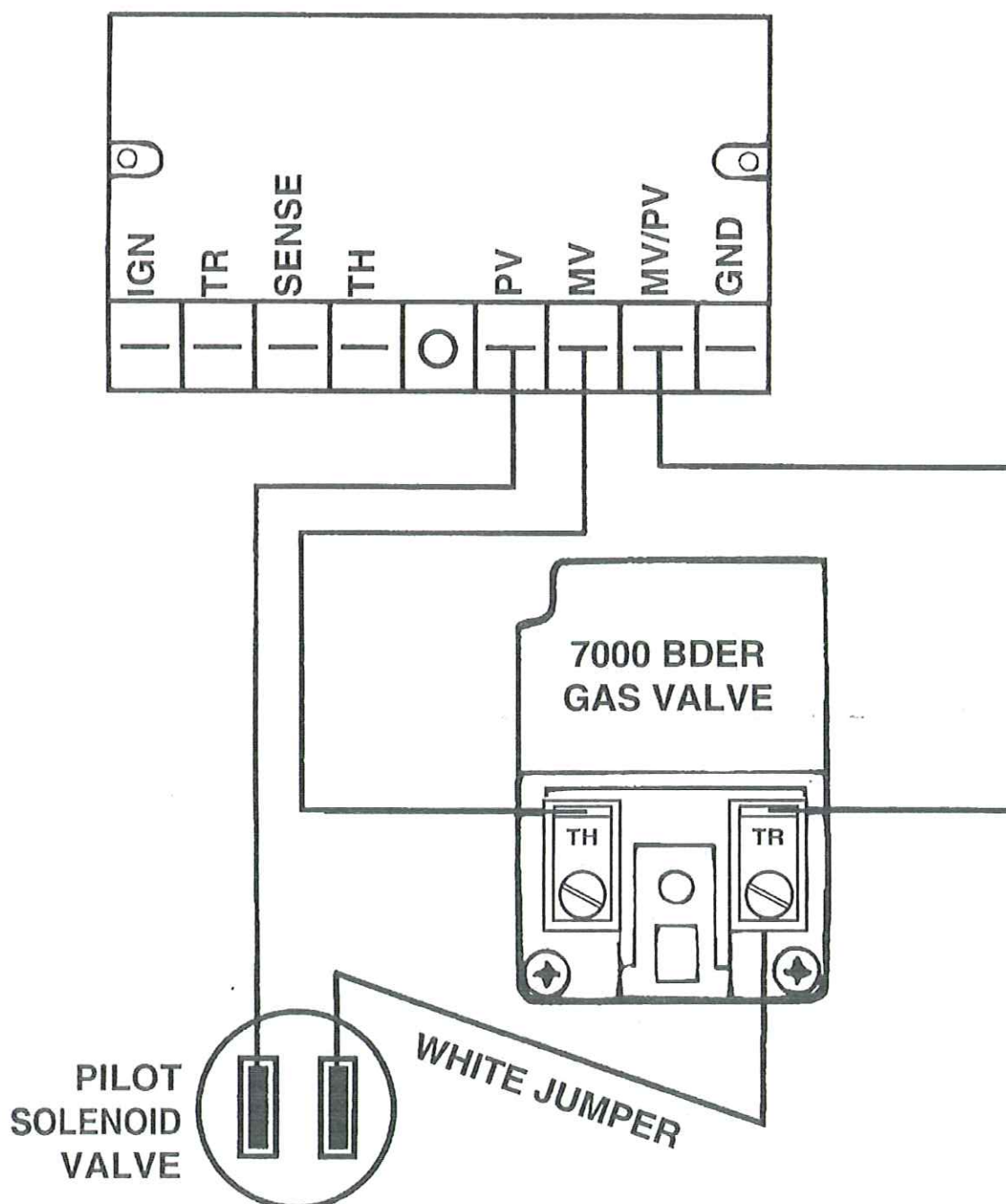
1. Shut off all gas and electricity to equipment being serviced.
2. Disconnect the wires connected to operator. Move them out of the way. **NOTE:** Mark them so they don't get connected wrong later on.
3. Locate the (4) screws that hold the valve operator to the valve body. Remove all 4 and remove the valve operator and gasket.
4. Locate the "slow opener disc." See drawing below. Using a sharp pointed tool like an ice pick, stick it into the slow opener disc and "pop" it out.
5. Reinstall the valve operator and gasket. Reconnect the wires removed in step 2 above. Restore gas supply and check for gas leaks.



## ROBERTSHAW CONTROLS COMPANY

UNI-LINE NORTH AMERICA • P.O. BOX 2000 • CORONA, CA 91718-2000  
CANADIAN DIVISION • 5785 KENNEDY ROAD • MISSISSAUGA, ONTARIO • L4Z 2G3

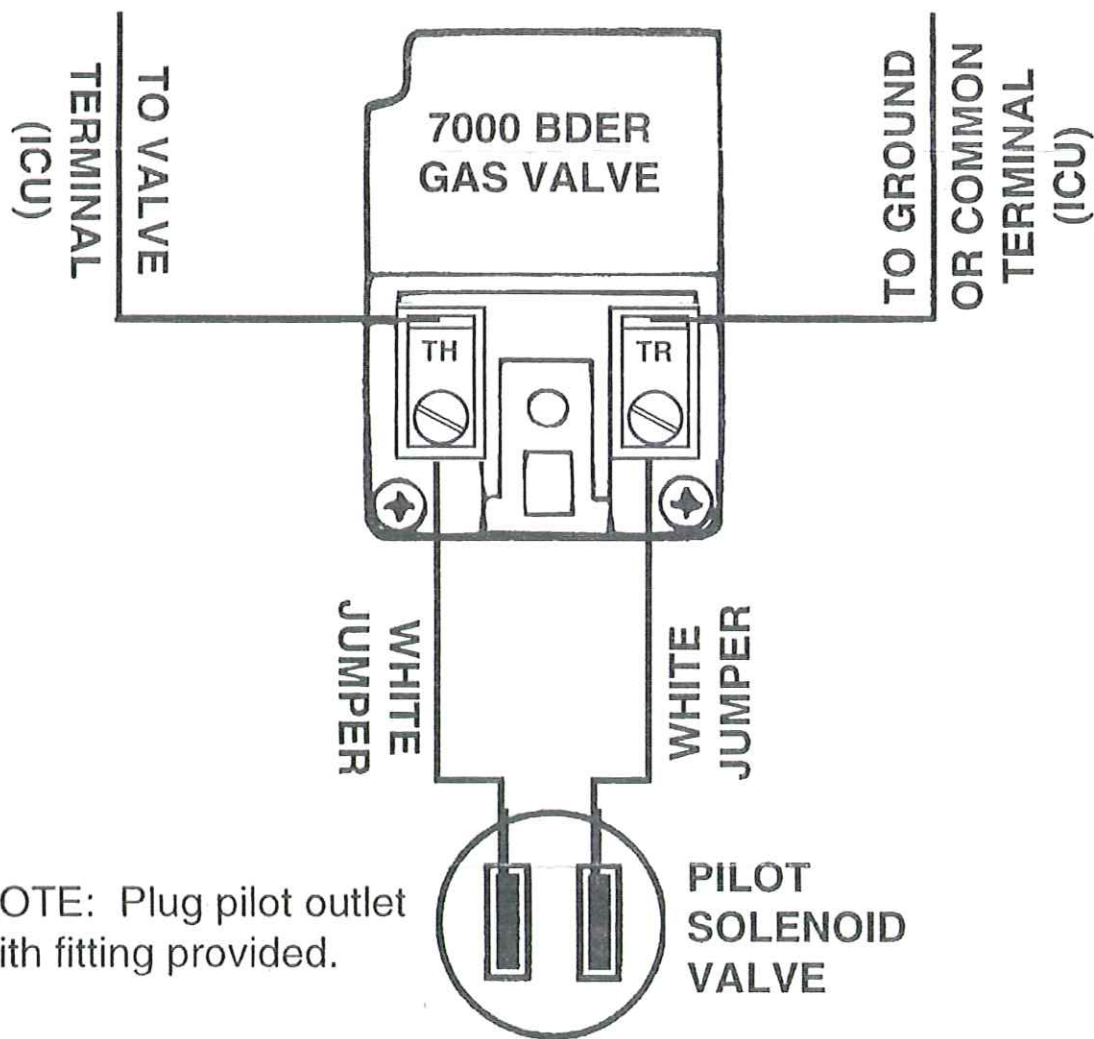
# INTERMITTENT PILOT APPLICATIONS





INSTALLATION DATA  
**7000 DER & 7000 DERHC**  
**SERIES**  
WIRING DIAGRAM

**DIRECT SPARK / HOT SURFACE  
APPLICATIONS**



**CAUTION:**

If the replacement gas valve being used has a "slow-opener" feature it will be indicated in the factory model number by -S7A, S7B, or S7C. Example: 7000DER-S7C.

A gas valve having a "slow-opener" **will not work** on direct spark or hot surface applications. The "slow-opener" can be quickly removed, see page 4 of the installation data sheet.

# INSTALLATION DATA

## 722 SERIES

### HOT SURFACE IGNITION GAS VALVE

The 722 series gas valve Uni-Kits® are designed for a wide variety of intermittent pilot, direct spark or hot surface heating applications. The 722 series Uni-Kits are dual automatic valves (redundant) that are pressure regulated and come factory set at 3.5" W.C. for natural gas. They can be converted to L.P. by installing the regulator conversion kit that is included.

The 722 series gas valves incorporate a manual selector valve ("On-Off"), dual automatic valves, main gas regulator and inlet/outlet pressure taps. All wiring connections and manual selector valve are easily accessible on top of the valve. With a 3-9/16" swing radius, the 722 series lends itself well to replacing many O.E.M. valves.

722 series gas controls are multiposition and can be mounted in any position (except upside down). To prevent unsafe attempts at repair, special screws are used and replacement parts are not available.

#### SPECIFICATIONS

Electrical rating	24 VAC, 0.4 amps
Pressure regulator	
Natural gas	factory set at 3.5" W.C.
L.P. gas	conversion kit included
Pilot outlet	1/4" tubing
(optional by model)	
Ambient temperature	-40° to 175°F
Maximum inlet pressure	1/2" P.S.I.

#### REGULATION CAPACITIES (BTUs)

SIZE	TYPE GAS			
	NATURAL		L.P.	
	MIN.	MAX.	MIN.	MAX.
3/8" x 3/8"	10,000	100,000	16,000	160,000
1/2" x 3/8"	10,000	100,000	16,000	160,000
1/2" x 1/2"	10,000	135,000	16,000	216,000
1/2" x 1/2" I.F.	10,000	100,000	16,000	160,000

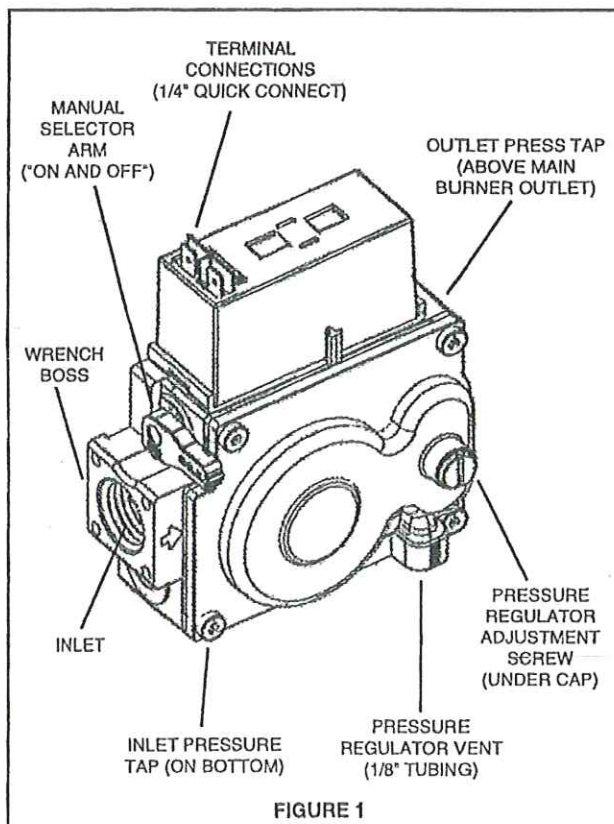


FIGURE 1

#### NOTE:

To prevent unsafe attempts at repair, special screw are used and replacement parts are NOT available.

#### INSTALLATION INSTRUCTIONS

##### CAUTION

THIS DEVICE SHOULD BE INSTALLED BY A QUALIFIED SERVICEMAN WITH DUE REGARD FOR SAFETY AS IMPROPER INSTALLATION COULD RESULT IN HAZARDOUS CONDITION.



To avoid possible injury, fire and explosion, please read and follow these precautions and all instructions on the appliance. This bulletin is intended as a guide to qualified servicemen installing or servicing Robertshaw Controls. Repairs, adjustments and servicing should be limited to the operations listed in this bulletin or on the appliance.

##### For Your Safety

IF YOU SMELL GAS: (A) turn off gas at line valve or meter, (B) open windows, (C) do not touch electrical switches, (D) extinguish all open flames, (E) immediately call your gas supplier from neighbors.

#### Turn off gas supply and electrical power to equipment before servicing.

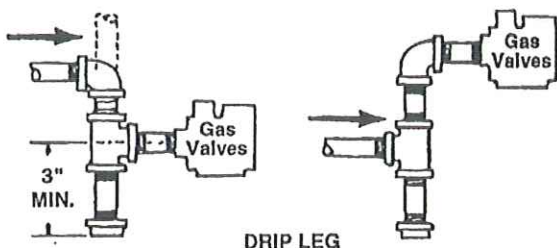
##### PIPING

1. If using an elbow flange for right angle gas flow be sure to install the "O-ring" gasket and torque the mounting bolts to 15 inch pounds. Do not overtighten.
2. Pipe or tubing must be clean and free of scale and dirt.
3. Make sure gas piping is pressure tested before control is connected. High pressure can damage control causing a hazardous condition. Do not subject control to more than 1/2 PSI, (14" W.C.) inlet pressure.



## INSTALLATION INSTRUCTIONS

4. If it's not already installed, a drip leg (sediment trap) must be added to the gas supply line to the control. (See figure below). All piping must comply with local codes and ordinances and with National Fuel Gas Code (ANSI Z223.1 / NFPA, No. 54).



5. Using pipe thread compound suitable for gas being used, apply a small amount on the male pipe threads. (Do not use Teflon tape or Teflon compound). Leave the first two threads clean. Never use compound on female threads as it might be pushed into the control body.
6. The gas valve is multi-position and can be mounted in any position (except upside down) without affecting its operation.
7. Install gas valve so gas flow conforms with the inlet and outlet of the control.
8. **DO NOT** insert any object other than suitable pipe or tubing in the inlet or outlet of this control. Internal damage may occur and result in hazardous condition. A backup wrench should only be used on the wrench boss provided for this purpose (see drawing), never on body of the control, as this could distort the casting. **NOTE:** Do not overtighten any pipe connections, as this could crack the valve body. A valve with a cracked valve body will not be warranted.

## PRESSURE REGULATOR VENT

The 722 series when equipped with pressure regulator has a built-in Vent Limiter. The regulator vent is taped 1/8" tubing if vent tubing is required. **CAUTION:** If bleed tubing is used, do not allow main burner or pilot flame impingement on the tubing as this will eventually cause clogging of the tubing and improper regulator operation. If bleed tubing is not used the regulator vent must be properly shielded from moisture.

## LEAK TEST

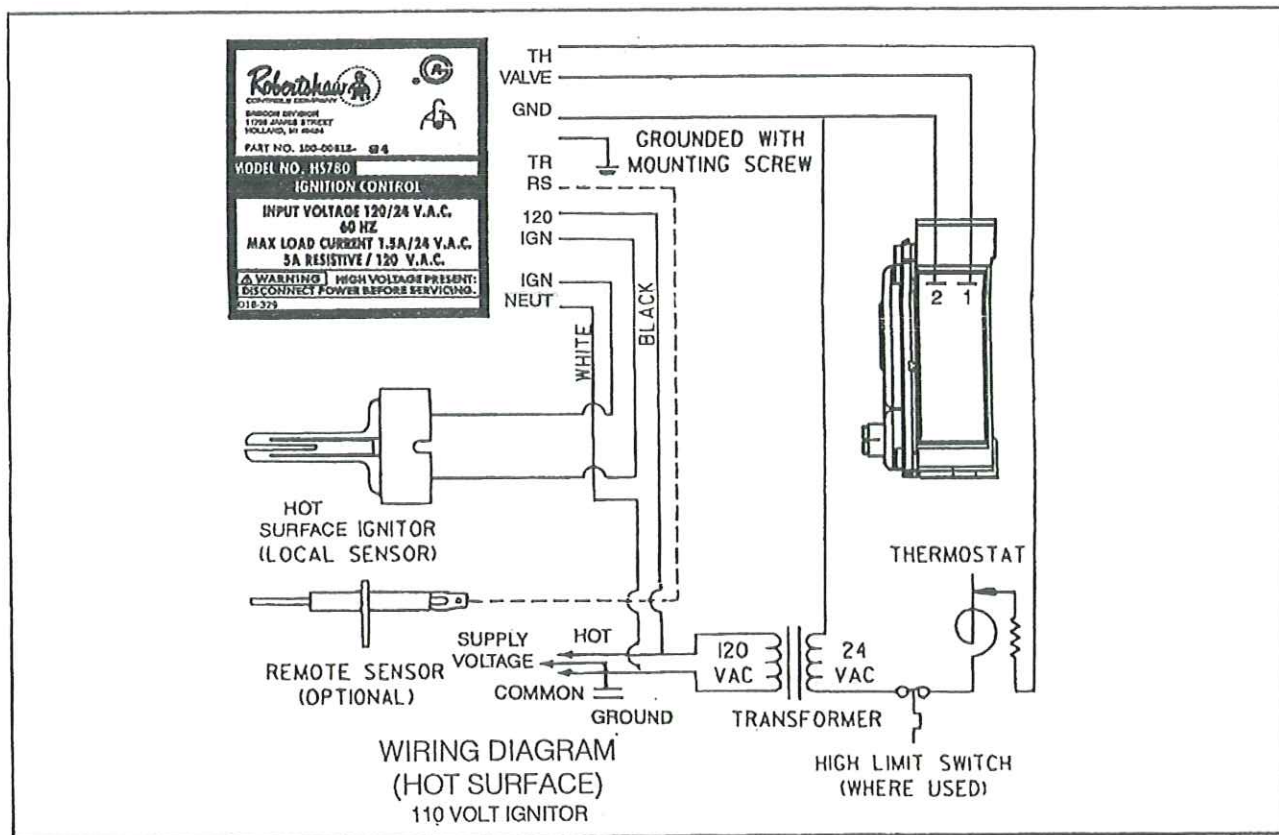
Leak test with a soap solution after installing with main burner on. Coat pipe and tubing joints, gasket, etc. with soap solution. Bubbles indicate leaks.

## WIRING

**DO NOT** short gas valve terminals. This will damage wall thermostat and void warranty.

Check the system for the proper transformer by comparing the VA ratings of the transformer and the system. The system rating is determined by multiplying the voltage draw times the amp draw. Normally 20VA transformers are sufficient for heating only applications and 40VA for heating / cooling applications.

**NOTE:** Improper transformer VA rating will cause erratic system operation.



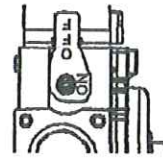


## OPERATING INSTRUCTIONS

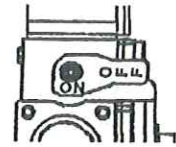
### CAUTION

1. **WARNING:** If you do not follow these instructions exactly, a fire or explosion may result with property damage, personal injury or loss of life.
2. Smell all around the appliance area for gas. If the appliance uses L.P. (bottled) gas, also be sure to smell next to the floor because L.P. gas is heavier than air.
3. **WARNING:** If you smell gas, immediately shut off the manual valve in the gas piping to the appliance. Don't touch any electrical switch or use the phone. Leave the building and call your gas supplier. If he cannot be reached, call the fire department.
4. **WARNING:** Do not force the gas control knob on the appliance. Use only your hand to push down and / or to turn the gas control knob. Never use any tools. If the gas control knob will not operate by hand, the control should be replaced by a qualified service technician. Force or attempted repair may result in fire or explosion.
5. **WARNING:** The gas control must be replaced if it has been -exposed to water.

1. Turn wall thermostat to its lowest setting. Remove burner access panel(s).
2. Selector arm must only be operated by hand (see below). **DO NOT** use pliers, wrenches or other tools to operate the arm. Move selector arm to the "off" position. See figure 2.
3. **WARNING:** Wait at least 5 minutes to allow any gas in the combustion chamber to vent. If you then smell gas in the appliance area or near the floor, **STOP** and follow warning instructions to the left. Failure to do so may result in fire or explosion.
4. Move selector arm to the "on" position (see figure 2) and set room thermostat to desired temperature. Allow burner to cycle on and off.
5. Leak test with a soap solution after installing with main burner on. Coat pipe and tubing joints, gasket, etc. with soap solution. Bubbles indicate leaks.
6. Replace burner access panel.



"ON" POSITION



"OFF" POSITION

FIGURE 2

## SERVICE INSTRUCTIONS

**CAUTION:** If control has been exposed to water in any way, it must be replaced. If gas valve fails to shut off, do not turn off electrical power. Turn off gas supply allowing fan or circulating pump (if so equipped) to continue running until system has cooled. Replace control.

### WARNING

Servicing of gas controls, appliance and systems must be performed by qualified service personnel only.

### PRESSURE REGULATOR ADJUSTMENTS

Adjustment of the pressure regulator is not normally necessary since it is preset at the factory. However, field adjustment may be accomplished as follows:

**NOTE:** See figure 1 on front page for locations of the inlet and outlet pressure taps.

1. Manometer or gauge attachment may be accomplished at the outlet pressure tap - see figure 1.
2. Remove regulator adjustment screw cap (A). See figure 3.
3. With small screwdriver, rotate adjustment screw (B) "clockwise" to increase, or "counterclockwise" to decrease pressure to comply with manufacturer's specifications.
4. Replace regulator adjustment screw cap (A).

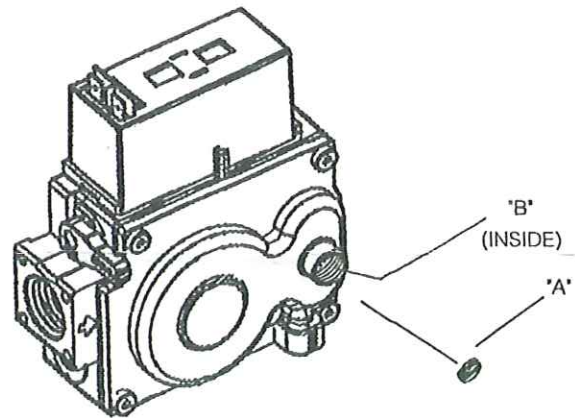


FIGURE 3

## SERVICE INSTRUCTIONS

### REGULATOR CONVERSION

**CAUTION:** Main burner and pilot orifices must be changed when regulator is converted from one type of gas to another.

The 722 series valves can be converted from natural to L.P. by installing the enclosed conversion kit.

1. Turn off gas and electricity to appliance.
2. Remove slotted cap (A), adjusting screw (B), and natural gas spring – not color coded – (C), from control. See figure 4.
3. Install new L.P. spring – color coded with a black strip.
4. Install new adjusting screw (B).
5. Attach manometer or pressure gauge to the outlet pressure. See figure 1 on front page.
6. Turn gas and electricity on.
7. Turn room thermostat to call for heat.
8. With burner on, adjust screw (B) to supply L.P. gas to pressure as recommended by the appliance manufacturer.
9. If adjusting screw (B) reaches its maximum depth (bottoms out) before recommended pressure setting is reached, turn screw counterclockwise until pressure drops slightly (approximately 0.1" W.C.) **WARNING:** Do not stretch or alter spring.
10. Turn off gas and electricity to appliance.
11. Remove manometer or pressure gauge and reinstall pressure tap outlet plug.

12. Install new red slotted cap in place of (A).

13. Turn gas and electricity on.

14. With burner operating, immediately check all fittings for leaks with soap solution. Bubbles indicate leaks that must be corrected.

15. Attach label to show control has been converted to L.P.

16. Set room thermostat to desired temperature.

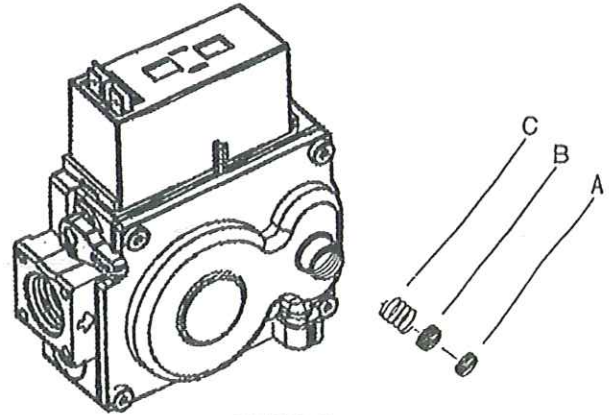


FIGURE 4

### HOT SURFACE SYSTEM TROUBLE SHOOTING

