

# ***SERVICE MANUAL***

HUMIDAIRE UNIT

***HU-60-1066***

**SAMUEL JACKSON**

***HUMIDAIRE UNIT***

## 14066 SERVICE MANUAL

### HU-60-1066 GAS-FIRED HUMIDAIRE UNIT

The HU-60-1066 Humidaire Unit produces warm humid air which is used to humidify cotton in ginning plants. It includes a modulating gas burner fired by natural gas, propane, or butane which burns directly in the air stream ahead of the water spray chamber. The water spray pressure is modulated by the operator from a remote manual control station, while the burner output is modulated by an internal automatic control to produce air of constant temperature. This control arrangement is modified when used with the 13800 Automatic Control in combination drying-humidifying applications.

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SERVICE MANUAL FOR HU-60-1066

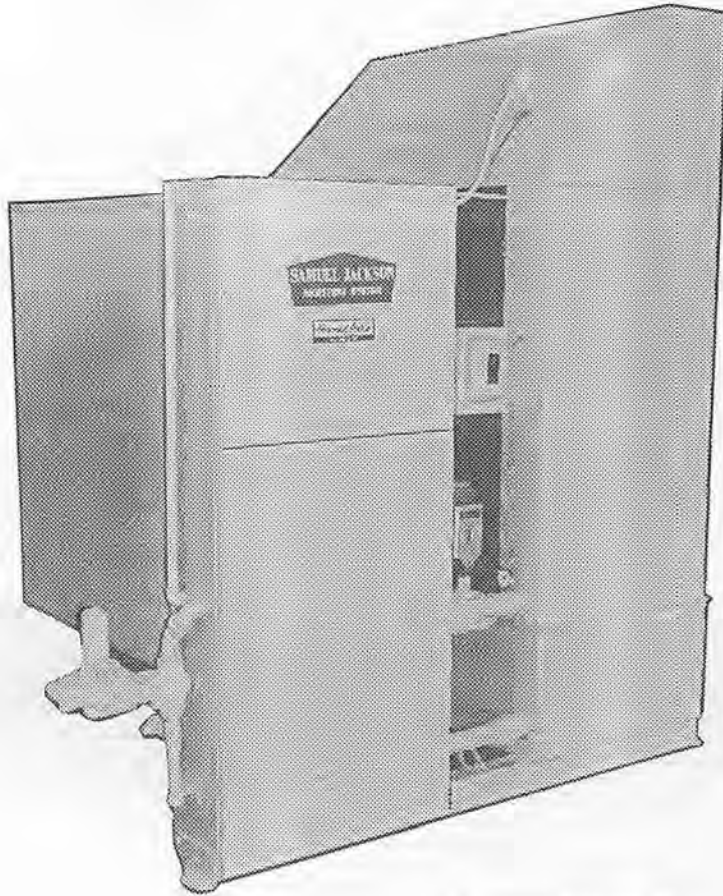
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\*Added or revised since previous issue

A-REV 5-82  
10-14066A

HU-60-1066

## GAS-FIRED HUMIDAIRE UNIT



**HumidAire**  
UNIT

### SPECIFICATIONS

At full throttle and 4000 cfm air delivery:

Burner input capacity.....2,000,000 Btu/hr  
Natural gas consumption.....2,000 cf/hr  
Propane consumption.....22 US gal/hr  
Water evaporation.....180 US gal/hr  
Water consumption (with bleed-off)  
220 US gal/hr  
Length.....8 feet  
Width.....5 feet  
Height.....8 feet

#### Utilities Requirements:

Minimum Water pressure.....15 psi  
Normal Fuel pressure.....5 psi  
Minimum fuel gas pressure.....4 psi  
Standard electrical power:  
220 or 440 volts, 3 phase, 60 Hz  
380 volt, 3 phase, 50 Hz

Drainage facilities should be provided for water drained or bled off.

The function of the HumidAire Unit is to generate and supply warm humid air. This humid air, which carries water vapor in a form quickly absorbed by cotton fibers, is blown into the cotton in various places in the gin plant. It is applied at the lint slide with the Lint Slide Grid and sometimes blown into the conveyor distributor. The HU-60 is being used in the final tower dryers to kill static electricity with humid air or dry the cotton with its burner.

This model is the result of over 20 years of experience, in fact, many HumidAire Units that old are still in use. This one is easy to maintain. The controls are dependable and simple to check. All parts of the spray chamber are quickly accessible through a large access panel. The mist eliminators slide out, and the nozzles, float valve and water tank screen are easily serviced.

#### HOW THE HUMIDAIRE UNIT WORKS

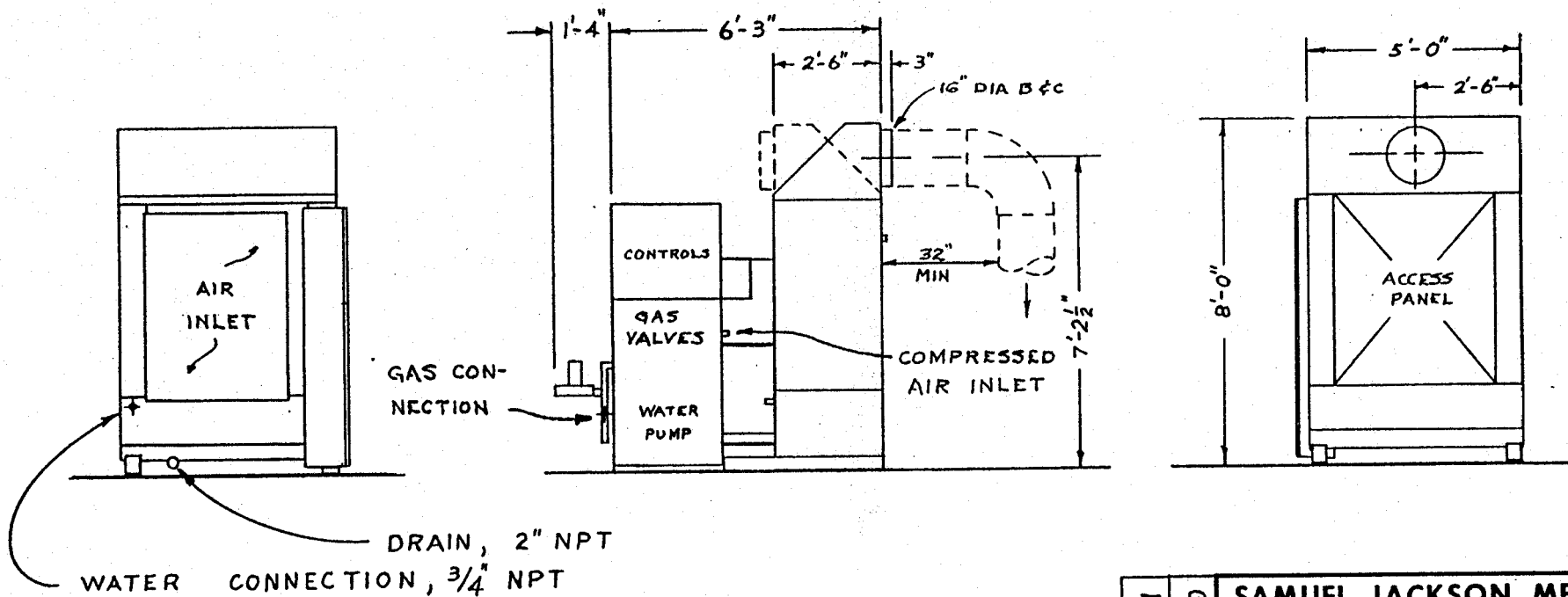
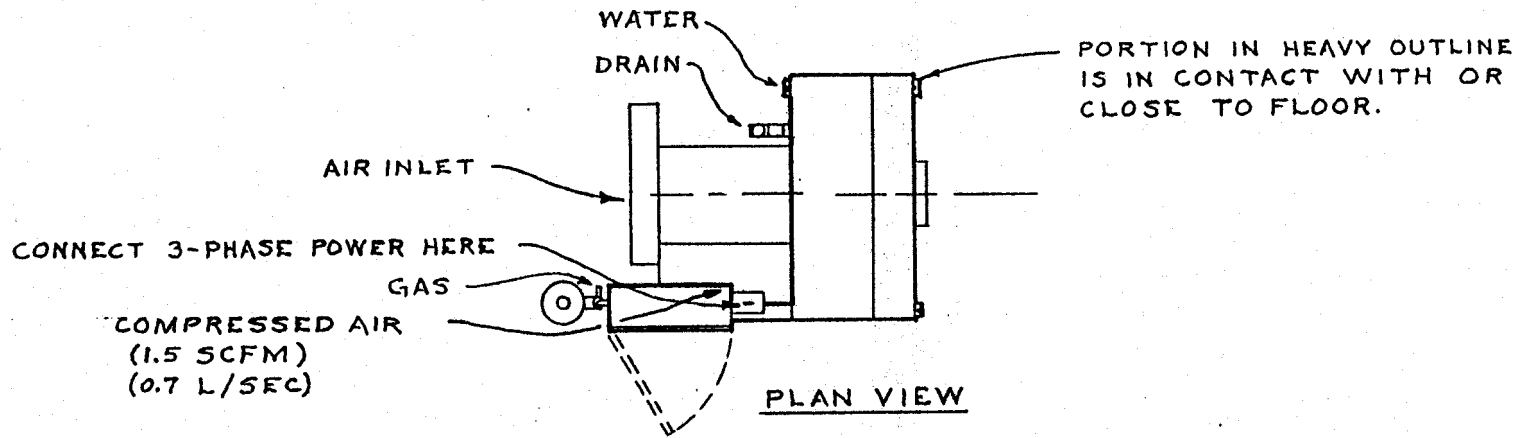
The HU-60-1066 HumidAire Unit produces warm humid air by heating the air with a gas burner then passing it through a water spray chamber. The gas burner operates on either natural gas or LPG, and burns in the entering air stream.

The hot air is scrubbed, cooled and humidified by a large volume of sprayed water in the spray chamber. The water is recirculated through the spray nozzles by a 2 HP pump. Zig-zag mist eliminator baffles at the top of the spray chamber allow the humid air to leave while retaining water droplets. The external fan which pulls air through the HU-60 blows it to the point where it is mixed with the cotton.

A float valve in the water tank replaces the evaporated water.

The HU-60 is usually regulated from a remote manual control station which has switches and indicator lights for the burner and water pump and a dial to turn the unit up or down. An automatic control is available for use in tower dryer installations.

- POSITIVELY ELIMINATES STATIC
- REDUCES STRAIN ON PRESS
- ELIMINATES TIE BREAKAGE
- PRESERVES STAPLE LENGTH
- IMPROVES TURNOUT



1/48 SCALE 1/4" = 1'-0"

B REV. 4-B-81	SAMUEL JACKSON MFG. CORP.	
	DIMENSIONS	
	HU - 60 - 1066	
	GAS - FIRED HUMIDAIRE UNIT	
A REV. 4-12-79	DWN. BY GJH	DRAWING NO.
	DATE 3/18/77	14-2266B

# GENERAL INFORMATION

## SAMUEL JACKSON MOISTURE SYSTEM

There are many variations to the Samuel Jackson Moisture System. Different gins have different problems which are solved by applying moisture to cotton in different ways. Each application consists basically of a Humidaire unit to generate warm humid air and a device to expose the cotton to the humid air. We will briefly describe the two basic Humidaire units and several of the devices or points of application of the air. More detailed information is available upon request.

### HUMIDAIRE UNITS

The HU-60-1066 Gas-Fired Humidaire Unit is used wherever natural gas, propane or butane can be economically obtained. Since its modulating gas burner burns directly in the air stream ahead of the water spray chamber, it can be used not only to humidify, but can be used to dry cotton if the recirculating water pump is turned off. This is the less expensive of the two Humidaire units available.

The HU-60-1065 Oil-Fired Humidaire Unit burns either diesel oil, kerosene (gas-oil), or jet aircraft fuel. The fuel is burned inside a stainless steel combustion chamber, which is located inside the water spray chamber and is cooled by the water spray. If the fuel used has a significant amount of sulfur, the gaseous products of combustion must be vented to the outside of the building. If low-sulfur fuel is used, a recirculation duct, furnished with the unit can mix the products of combustion with the incoming air stream thus utilizing all of the heat energy of the fuel. This will reduce the fuel consumption by about one-half or allow increased humid air output. This must never be done with high-sulfur fuel as the sulfur oxides will form sulfuric acid in the water and seriously damage the machine.

Since combustion takes place in the separate chamber, the HU-60-1065 cannot be used to heat the air stream for drying purposes. It is only for humidification.

### LINT SLIDE GRID

The most popular application device is the LSG-1070 Lint Slide Grid Assembly. It is a relatively new method of restoring moisture. The batt of cotton passes over the grid on its way from the battery condenser to the press box, and humid air is blown upward through the grid and through the cotton, adding moisture to it. This air may then escape into the atmosphere of the gin building.

A recent improvement is to cover the lint slide with a hood arrangement to collect the used humid air and lint fly and return it to the lint flue rising to the battery condenser. No fan is used for this, only the vacuum on the lint flue. This method keeps the gin plant cleaner, and uses the humid air twice.

Adding moisture in this manner reduces strain on the tramper and press, eliminates problems with broken straps or bale ties and brings the moisture content of the cotton up to between six and eight per cent. The weight added is typically 7 kilos (15 pounds) per bale. The moisture also causes the cotton fibers to straighten so the classer will usually call it 1/32-inch longer than otherwise. For this reason, if an automatic sampler is used, a 4-inch diameter (100 mm) pipe of humid air should be introduced into the pipe taking cotton to the sampler. This will make the sample representative of the baled cotton. Of course, if sampling knives on the press platens are used in conjunction with a bale-bagging system, this sample will be representative in moisture content.

### CONDENSER AIR SWITCH CONTROL

This device is used with the lint slide grid to switch the Humidaire unit from producing humid air to warm, dry air when no cotton is coming from the battery condenser. It does this by sensing the difference between air pressures in the condenser riser and inside the condenser drum.

### CONDITIONING HOPPERS

Humid air is often applied to seed cotton in Jackson Conditioning Hoppers, which are installed between the conveyor distributor and the feeders over the gin stands. These conditioning hoppers retain the cotton between perforated screens while humid air is blown through. With such long exposure time, it is possible to raise the moisture content to the recommended level of 6 to 8% for optimum ginning. This high level of moisture content is necessary to preserve the staple length and spinning qualities of the cotton. Usually, only those gins which maintain close liaison with the spinning mills will be financially rewarded for this. Other gins in dry areas use conditioning hoppers to kill static electricity so thoroughly that it will flow smoothly down the feeder aprons, through the lint cleaners and out the battery condenser without any problems.

Jackson Conditioning Hoppers have recently been improved in several ways. They are now made in sizes to replace the existing change-bale hoppers in modern gin plants without raising the conveyor distributor. No suction manifold or fan is now necessary. The used humid air is made to follow the cotton down into the feeder. An air-operated valve now stops the flow of humid air into the hopper when the feeder below stops operating.

### TOWER DRYERS

In many parts of the American Southwest, climatic conditions are sometimes so dry that static electricity holds the dirt and trash in the cotton so strongly that it cannot be removed in the cleaners. Under such conditions, some gins have found it advantageous to apply humid air in the last tower dryers. With this method, the static is killed so the last cleaners can function, and all of the cotton receives uniform exposure to the humid air.

With each final tower dryer, a gas-fired Humidaire Unit is used instead of a conventional burner, and supplies all of the air for its tower dryer. The Humidaire unit functions as a burner when its water pump is turned off. While the burner capacity of the gas-fired HU-60 is normally set at 2 million btu/hr when it leaves the factory, it is simple to change it to a 3 million btu/hr burner by changing the burner orifice disc. In tower dryer applications, the 13800 Automatic Control is used. It maintains a constant temperature in the tower when drying cotton and a constant relative humidity when humidifying.

### CONVEYOR DISTRIBUTOR

In gins which have static electricity problems only occasionally, humid air can be introduced with the seed cotton into the conveyor distributor and allowed to escape at the overflow end. The Humidaire unit for the lint slide grid is sometimes used for both purposes. This method does not add much moisture, and what it does add is not uniform; however, in some cases it has provided an economical answer to the static problem.

Don't use this

## SECTION 2

### INSTALLING THE HU-60-1066 HUMIDAIRE UNIT

**HOISTING** Do not attempt to lift the Humidaire Unit with a fork lift unless using a special attachment on the right fork. The center of gravity is behind the base of the spray chamber, and the unit will tip over. A hoisting ring is welded to the base frame between the control cabinet and the spray chamber. The unit is shipped with a piece of plywood bolted to the top of the spray chamber. This plywood has a hole which is over the center of gravity. Pass a chain or cable down through this hole and hook it in the hoisting ring. The unit can now be lifted from above using a boom truck, fork lift, or chain hoist.

**LOCATION** If the location of the Humidaire unit has not been specified on gin plans, it should be located in a clean place fairly close to the point of application of humid air. If the pipes are insulated (lagged), the humid air pipe can be run 80 to 100 feet (25 to 30 m) without difficulty.

Outside the USA, some insurance companies or government authorities may require the Humidaire unit to be located in a room separate from cotton processing operations. In gins where it is necessary to install the HU-60 overhead, see page 2-11.

**HOOD ASSEMBLY** The air discharge hood which goes on top of the spray chamber is shipped disassembled. Assemble it as shown in figure 1, paying particular attention not to get the internal baffle backwards. Note that the discharge opening can face either direction.

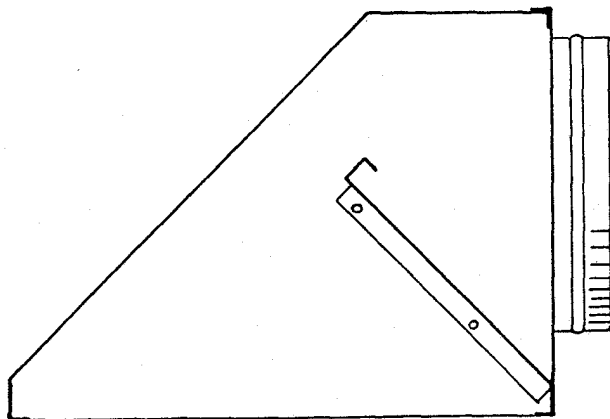


FIGURE 1

**AIR PIPES** Connect air pipes in accordance with installation drawings. **IMPORTANT:** Even if not shown on drawings, make sure a slide valve is installed to regulate the flow of air through the Humidaire Unit. This is usually installed between the HU-60 and the fan. It may be located on the discharge side of the fan, especially where two valves are used to distribute humid air to two points of application.

Joints should be taped to prevent air leakage before draw bands are applied to joints. The pipe which conducts the humid air to the point of application is often insulated or lagged to prevent condensation. If the insulation has an outer covering which is impervious, then it should not be applied to the pipe joints. Otherwise, slight leaks of vapor through the pipe joints will fill the insulation with water vapor which will cause condensation. Interrupting the insulation at the pipe joints allows this vapor to escape.

**OTHER ASSEMBLY** The water screen is also shipped in the spray chamber. It goes in the bottom of the water tank, covering the pump intake pipe, but not the drain outlet as shown in figure 2.

The gas regulator assembly is in a separate carton, and should be connected to the union on the side of the cabinet, the extended pipe resting in the bracket provided.

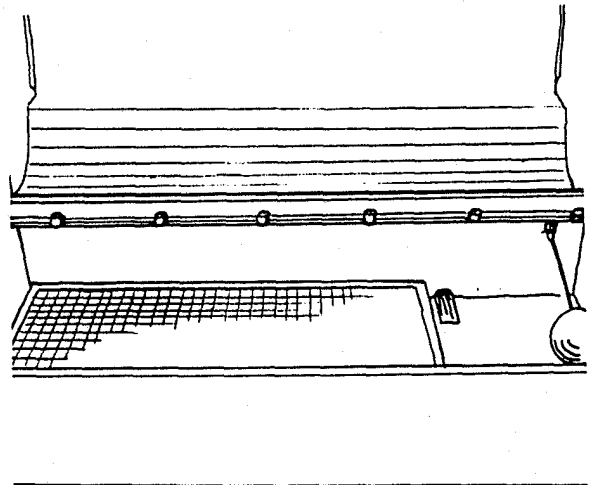


FIGURE 2



**ELECTRICAL** For making electrical connections, see pages 2-7 and 2-8.

**FUEL GAS** Connect the pipe supplying natural gas or LPG to the gas cock on the gas regulator assembly. Make sure gas supply pipe does not interfere with removing air inlet screen. The pipe used should be free of sand, metal chips and other debris. Even if it is, use the gas to flush the pipe by removing the pipe cap at the bottom of the gas regulator assembly and opening the gas cock until clean gas comes out.

**DO NOT** take gas supply from downstream side of low pressure regulator serving another burner. Go ahead of such regulators to get a pressure of 5 to 25 psi (.3 to 1.7 bars). Regulator installed in the HU-60 will lower this to the proper level (to be adjusted by serviceman at start-up). Ordinarily 1½-inch pipe will be adequate, but if more than one HU-60 is served or long distances are involved, refer to page 2-9 for pipe sizes.

The burner capacity of the HU-60-1066 is nominally 2 million Btu/hr (500,000 Kg-Cal/hr), but it can be increased to 3 million Btu/hr for tower dryer installations or reduced to 1 million for short lint slide grids simply by changing the orifice disc in the burner head. The required burner capacity is determined by the quantity of air flowing through the unit.

Typical full-throttle fuel consumption at 2 - million Btu/hr is as follows: Natural gas--2,000 cu. ft/hr (57 cu m/hr); Propane--22 gal/hr (80 liters/hr or 47 Kg/hr).

For LPG (propane or butane) installations, some gins use a large storage tank without a vaporizer. In such cases, make sure that your gas man installs a 15-pound regulator at the tank. **DO NOT** run the high-pressure gas underground ahead of the regulator. To do so will cause condensation of liquid LPG in your gas line. This will damage the HU-60 and other burners, and will create a dangerous condition. If the gas line in your building feels extremely cold during operation, you have liquid in your line, and you should correct the situation immediately. See page 2-10 for more LPG information.

Some local authorities may require piping the screened vent opening of the gas regulator and the vent pipe on the cabinet to the outside of the building.

**WATER SUPPLY** Connect a ½-inch water supply pipe to the connection at the float valve in the water tank. We have provided a hydrant at this point for convenience in washing out the unit. Supply pressure should be at least 20 psi (1.4 bars).

Maximum water consumption at full throttle will be about 220 gal/hr (850 liters/hr) of which about 85 per cent is evaporated and the remainder is bled off to the drain. Average water consumption will be much less than this, perhaps as little as 50 gal/hr when the unit supplies humid air only to the Lint Slide Grid.

Some users have installed water softeners to minimize scale deposits in the HU-60. Make sure the softener cannot recharge while the HU-60 is running. If it does, the salt it puts in the water will cause corrosion damage far more expensive than scale accumulation. We can supply our No. 14000 Powdered Acid Descaler in 50-pound pails. To remove scale, 10 pounds of the powder is added to the water in the tank while the unit continues to operate normally. The scale is usually removed in 24 hours. These practices will not eliminate the need for water bleed-off as described below.

**WATER DRAINAGE FACILITY** Connect the 2-inch water drain fitting to a sewer or soakage pit to receive the water periodically released by draining and cleaning the unit as well as that continuously bled off while the unit is running. The purpose of bleeding off is to reduce maintenance by getting rid of the minerals in the water. The water evaporated by the HU-60 is distilled water. All minerals are left behind in the machine. This stream of bleed-off water provides the only way to get rid of them. A water softener exchanges sodium ions for harder ions, so some bleed-off is still necessary to avoid scale.

## HU-60 STARTUP

(THIS WILL NORMALLY BE DONE BY SAMUEL JACKSON SERVICEMAN IN USA)

THREE-PHASE POWER should be present in the disconnect switch box located to the right of the control cabinet. This can be checked by measuring the voltages across terminals 1 and 2, 2 and 3, and 1 and 3. They should be as indicated on the tag attached to the box.

THE FAN RELAY COIL in the remote control needs to be checked to assure that it has been properly matched with the voltage of the holding coil or pilot light for the Humidaire Units's fan motor.

PUMP INSPECTION: Make sure that the pump shaft can turn freely by turning the shaft with a screwdriver inserted into the motor shaft end. The pump can be jammed by rust in the pump bowl; by the inlet pipe or pipe dope interfering with impeller inlet sleeve; or in old units, by an accumulation of lint in the motor.

PURGING THE GAS LINE assures a clean flow to the solenoid valves during operation. Remove the cap at the bottom of the nipple at the gas regulator and turn on the gas cock until the gas coming out of the nipple smells like gas and is free of dirt or chips. Replace the cap and slowly turn on the gas. Check for gas leaks inside the cabinet and along the gas supply line.

CHECK MIST ELIMINATOR located in the upper portion of the spray chamber just below the air discharge hood. It should slide freely in and out of its position. Remove the eliminator and...

CHECK BAFFLE IN HOOD that it has been installed as shown on page 2-1. See that temperature sensor is installed in hood. Replace the eliminator.

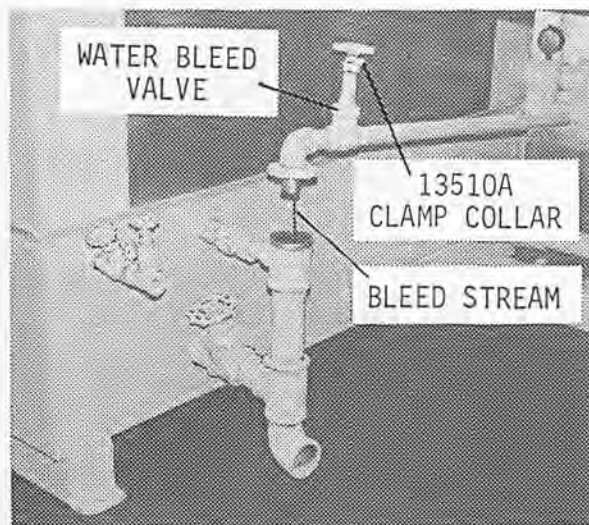
THE WATER TANK SCREEN needs to be in its proper position at the left hand side of the bottom of the tank. This will shield the pump impeller and nozzles from clogging.

FLOAT VALVE: The water may now be turned on to fill the tank. Close the drain valve. Adjust the float valve so that the water level is about 1/2-inch (12 mm) below the overflow. The float valve may be adjusted with the segmented elbow or by bending the rod up (but never down). Replace the panel door.

PUMP ROTATION can be checked by briefly connecting a jumper between terminals 3 and 7 on the main terminal block and observing the direction of the slinger on the pump shaft as it slows down. The shaft should rotate clockwise when viewed from the motor end. The direction can be reversed by interchanging any two leads at the bottom of the motor starter. Do this with the power off.

WATER MODUTROL MOTOR At the remote control, turn both switches off. Set remote dial to 100, which will open the water valve when Terminals 3 and 7 are jumpered. Water pressure should be about 18 psi on 60 HZ, 13 psi on 50 HZ. Setting dial to 0 should close the valve and reduce the water pressure to 1 or 2 psi. (On early models, which have 3-port water bypass valves, the valve will close to increase pressure and vice versa. Also the water pressures will be 4 to 22 psi on 60 HZ, 3 to 15 psi on 50 HZ.)

WATER BLEED-OFF Tighten the stem packing nut on the water bleed valve. Now, with the water pump producing maximum pressure, the water bleed-off can be adjusted. With a 3/16-inch hex key (allen wrench), loosen the 13510A Clamp Collar on the stem of the bleed valve. (Units shipped before July, 1978 had a round collar which was difficult to adjust.) Lift the bleed apparatus out of the overflow, and adjust the valve so that a stream of water about 1/4-inch (6 mm) diameter comes from the pipe. Place the clamp collar snugly down against the packing nut. Tighten it on the valve stem so that this minimum water flow is maintained when one closes the valve. Inspect all water pipes for leaks.



**AIR FLOW** Turn on the Humidaire fan and adjust slide gate valve for reasonable air flow. If air is being applied in a lint slide, it should not blow cotton out of the slide. If in a tower dryer, it should not pull water through the mist eliminator. If the slide valve must be choked down severely, it would be advisable to slow down the fan.

**BURNER ADJUSTMENTS** Remove the cover of the Protectorelay and plug in the flame current meter (set on 25 uA scale). With the Humidaire fan running and both toggle switches off at the remote or automatic control, place a small crescent wrench on the pilot gas cock with the cock closed, and prepare to open it. Temporarily disconnect the yellow wire on the right side of terminal 18. This will prevent the main gas solenoid valve from opening while adjusting the low flame setting.

Clip a jumper to terminal 6 and touch the other end to terminal 5 to make the burner start. (If nothing happens, see "Air Flow Switch" below.) As soon as the jumper is touched to terminal 5, the "L" relay on the Protectorelay should pull in. This means that the pilot solenoid valve is open and spark ignition has started. Bring the pilot gas cock open until you see the "F" or flame relay pull in. Observe the flame meter to see that the reading is steady and above 2 microamps. However, the flame should be small. If there is a large air flow through the HU-60, the flame current may be erratic. Open the air shutters. (Ref 12, page 6-2)

If this is not adequate, remove the air shutters. If this is not adequate, note the position of the insulator on the flame electrode, remove it and bend the electrode about 30° outward toward the burner shell. Reinstall the electrode. RECONNECT THE YELLOW WIRE TO TERMINAL 18.

**AIR FLOW SWITCH** If nothing happens when Terminal 6 is jumpered to 5, the air flow switch (Ref 31, page 6-6) should be adjusted because of low air flow through the HU-60. The adjustment screw in the center of the mounting stud should be turned counter-clockwise. If this does not work, close down the air shutters as shown in Figure 1.

With the burner on (because of jumper 6 to 5), stop the humid air fan. The fan should have to coast somewhat before the burner goes off. This tests operation and adjustment of the air flow switch. If the burner turns off and on when turned on at full fire, more adjustment counter-clockwise should cure it.

**FAN SAFETY RELAY** With jumper removed and fan on, turn on burner switch at remote control. If burner does not come on, electrician has probably not connected wires to fan relay coil. Have

him do this. With burner on, push "stop" button for humid air fan. The burner should go off instantly if fan relay is working properly.

**GAS MODUTROL MOTOR** (Ref 24, page 6-6) is governed by the temperature sensor (Ref 32, page 6-6) and the set point control (Ref 1, page 6-6) which should be set at about 105. The modutrol motor throttles the gas flow to maintain a constant temperature in the air leaving the HU-60. Check this by turning on the water pump to cool the air. The gas valve should open to correct this. With the gas valve open wide, the gas pressure on the burner (Ref 27, page 6-6) should be from 2 to 4 psi. This can be adjusted by the ...

**GAS PRESSURE REGULATOR** (Ref 22, page 6-2). Remove the regulator cap and with a 1/2-inch square socket drive, turn clockwise to increase gas pressure. If this does not give adequate pressure, check the gas supply line to see if it passes through a low-pressure regulator. If not, contact the gas company.

**BURNER JET** If the burner operates for several minutes with the gas valve wide open and over 3 psi on the burner, yet the water in the tank does not heat up, the burner jet may be too small for the air flow. Try the next size larger. See page 6-4.

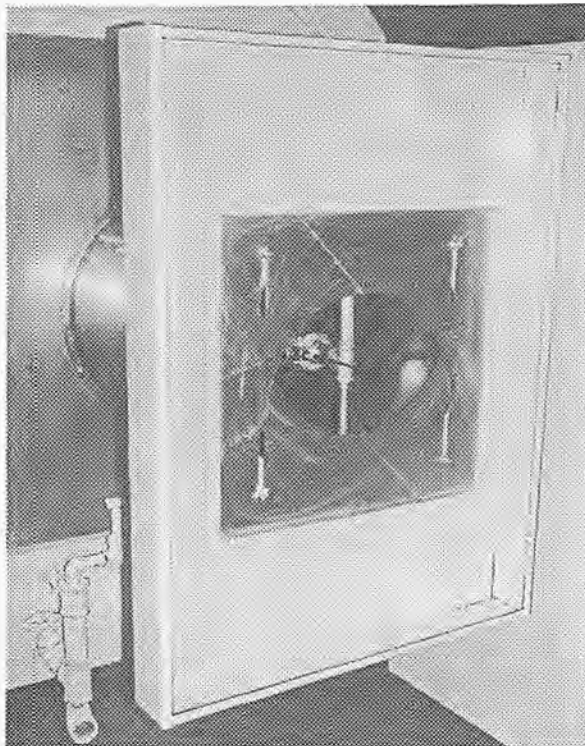
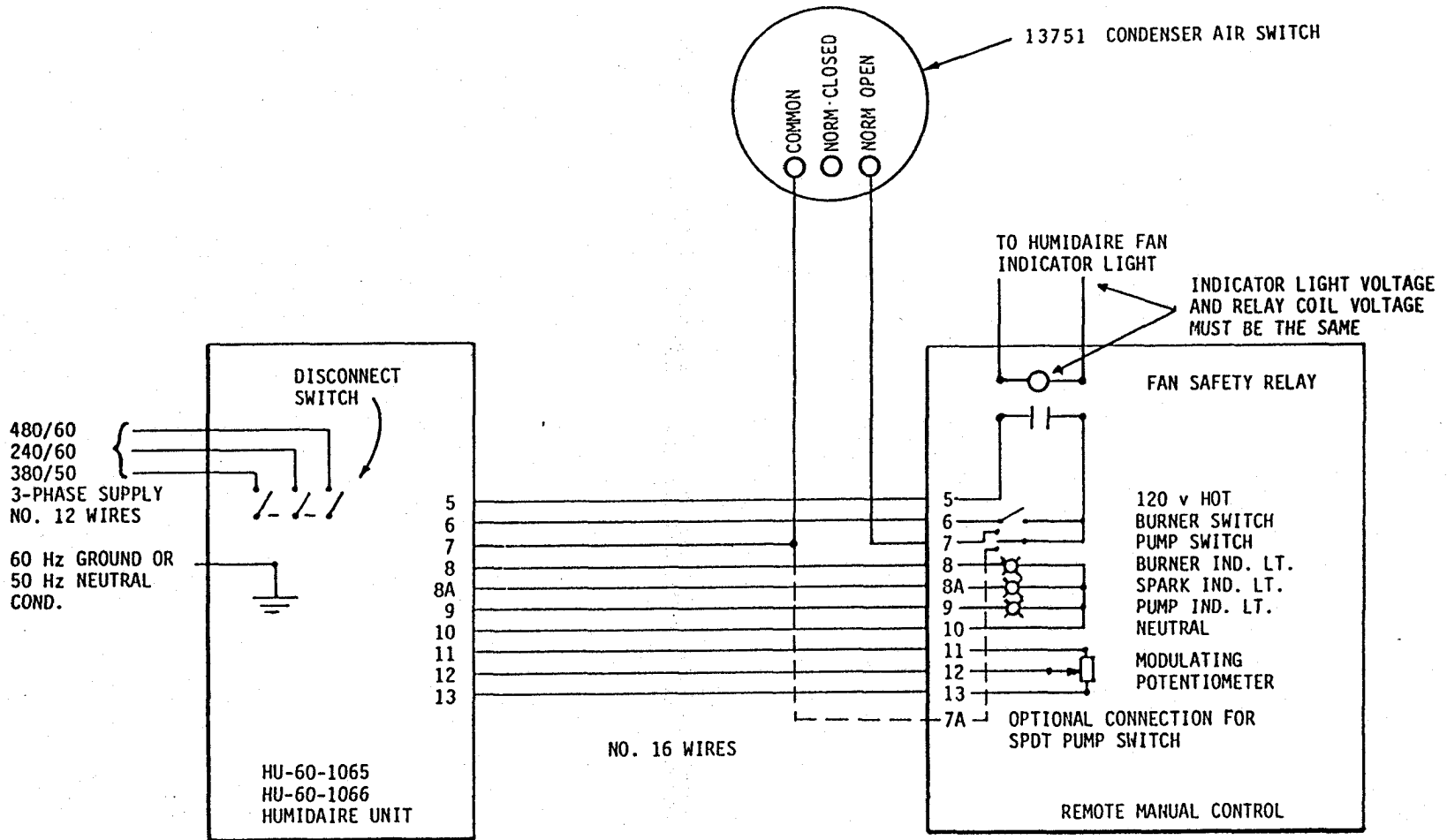


Figure 1



### EXTERNAL ELECTRICAL CONNECTIONS

### HU - 60 HUMIDAIRE UNITS

### FOR UNITS WITH MANUAL CONTROL

## ELECTRICAL INSTALLATION NOTES

THREE-PHASE SUPPLY TO HUMIDAIRE UNIT Run three-phase power to the Humidaire Unit from a fusible disconnect switch or circuit breaker which you will install. A motor starter for the water pump motor is included in the Humidaire unit, also a stepdown transformer for 120-volt control power. Look at the slinger on pump motor shaft to check proper rotation direction. Note that a time delay relay prevents the water pump from starting until the burner has operated for 150 seconds. If three-phase voltage supplied does not correspond with that shown on shipping tag of Humidaire Unit, the overload relay on the water pump motor starter and the connections on the control voltage transformer must be changed.

13800A AUTOMATIC CONTROL See preceding pages for installation instructions. Note that the automatic control requires a larger panel cut-out than the 12400A Manual Control, and requires certain wires to be shielded or separated from power wires.

12400A REMOTE MANUAL CONTROL A few installations will still use this manual control. It can be mounted in its own box. If installed in the gin console, cut a rectangular opening 6-1/8 wide by 4-5/8 high (155 mm by 118 mm). Mounting clips are provided for this purpose. See Drawing 14-2288E for wiring connections.

FAN SAFETY RELAY The installing electrician must connect the coil of this relay to the pilot light for the Humidaire fan. Although every Humidaire Unit has an air flow switch, this relay is an extra safety device. It turns off the burner instantly when the fan motor stop button is touched. This relay is mounted under the chassis of both the automatic and manual controls. Make sure the voltage stamped on the relay coil agrees with the voltage of the pilot light.

# 13290A

## CONDENSER AIR SWITCH CONTROL

### INSTALLATION INSTRUCTIONS

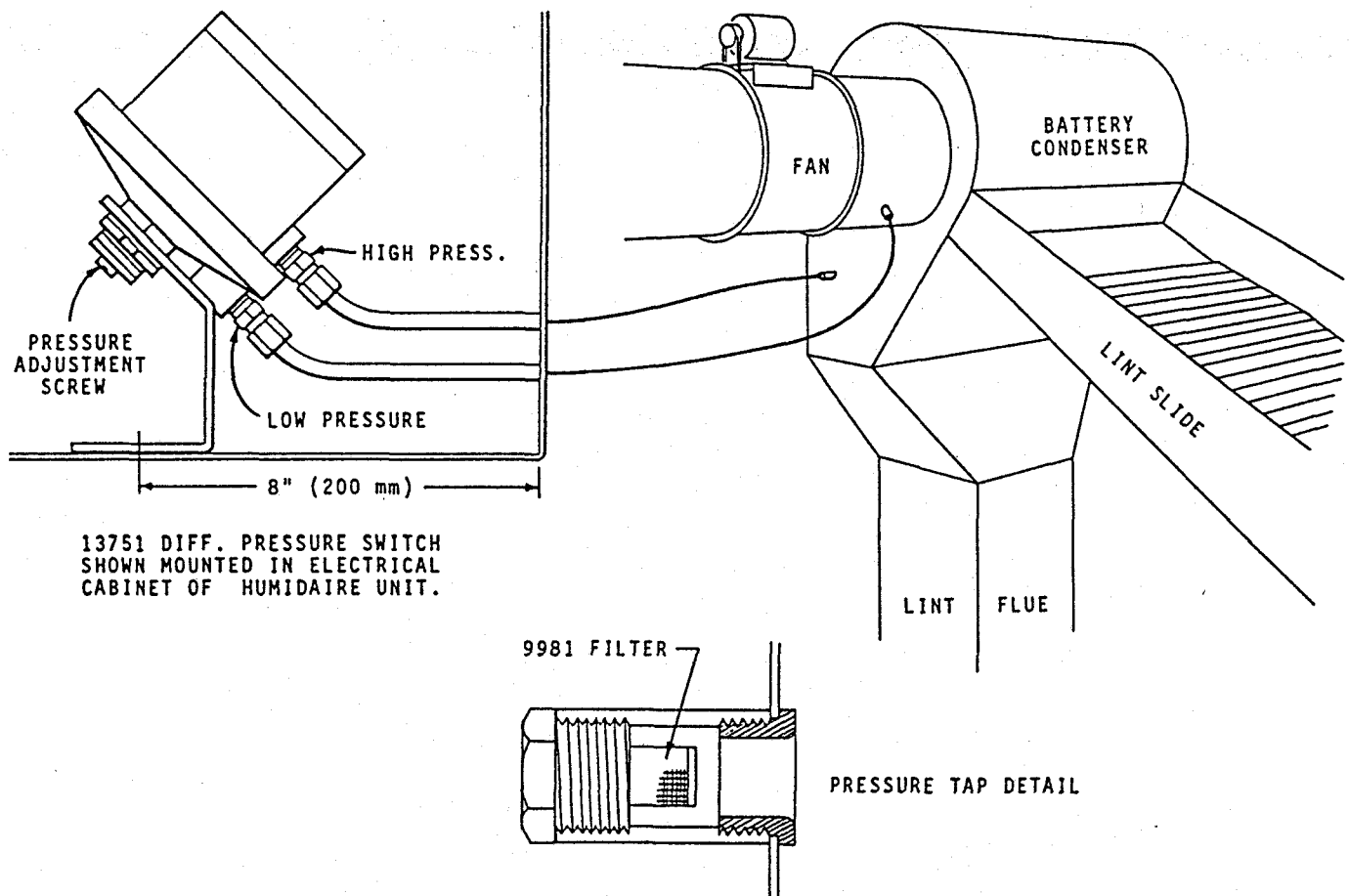
**1. Application** The 13290A control is used to determine when cotton is passing through a battery condenser. It is used with the Samuel Jackson Humidaire Unit to stop its water pump and turn down its burner when no cotton is being ginned. It can also be used to control a model LS Lint Slide Spray unit.

This control works by sensing the difference in air pressure between the two sides of the condenser screen. When no cotton is on the screen, the pressure difference will be almost zero. When a batt of cotton is being condensed, the air pressure inside the screen will be lower than the air pressure in the lint flue. The control senses this difference and closes an electrical contact.

**2. Pressure Range** With the previous 13290 control, the differential pressure across the screen had to be at least .6 inches (15 mm) water column when a batt was being condensed. The 13290A control will operate on .3 inches (8 mm). If even greater sensitivity is required, the operating point can be reduced to .15 inches (4 mm) by installing the 13760 orange calibration spring in place of the red spring which is in the 13751 differential pressure switch. One can replace the calibration spring by removing the pressure adjustment screw in the center of the mounting stud.

**3. Pressure Taps** Pressure taps should be made as shown in the sketch. The high-pressure tap should be made in the lint flue or in the side of the battery condenser. The low-pressure tap should be made in the condenser air discharge line between the condenser and its suction fan. Both taps should be made within arms length of an access door to facilitate installation. Both taps should be located where they will be easily accessible for occasional inspection and cleaning of the filter. The high pressure tap should usually be located near the condenser screen. It should not be located upstream of an elbow or other restriction in the lint flue. It is necessary to make a 7/8-inch diameter (22 mm) hole for each pressure tap. A hole saw is provided for this purpose.

**4. Mounting the Switch** The 13751 differential pressure switch should be mounted near the battery condenser. Enough tubing is supplied for the switch to be 25 ft. (7.6 m) from the condenser. If more tubing is obtained, the switch may be mounted at twice this distance and still operate satisfactorily. The switch may be mounted in the electrical control cabinet of the HU-60 Humidaire unit as shown in the sketch. Be sure to connect the high-pressure port to the lint flue pressure tap and connect the low-pressure port to the other pressure tap.



5. Electrical Wiring The wiring diagram below shows how this control may be connected to a Humidaire unit. If used to control a model LS Lint Slide Spray unit, connect the 13751 pressure switch to terminals 9 and 10 of the LS unit in place of the wand switches. In both cases, use only the "common" and "normally open" terminals of the 13751 pressure switch. Do not use the center terminal.

6. Adjustment The 13751 pressure switch can be adjusted only while the cotton gin is in operation. The pressure adjustment screw is located in the center of the mounting stud. The differential pressure required to operate the switch (operating point) is increased by turning the screw clockwise and decreased by turning it counter clockwise. The operating point should be increased if necessary to make the switch contacts open when no batt is being condensed. The operating point should be decreased if necessary to make the switch contacts close when a batt is being condensed.

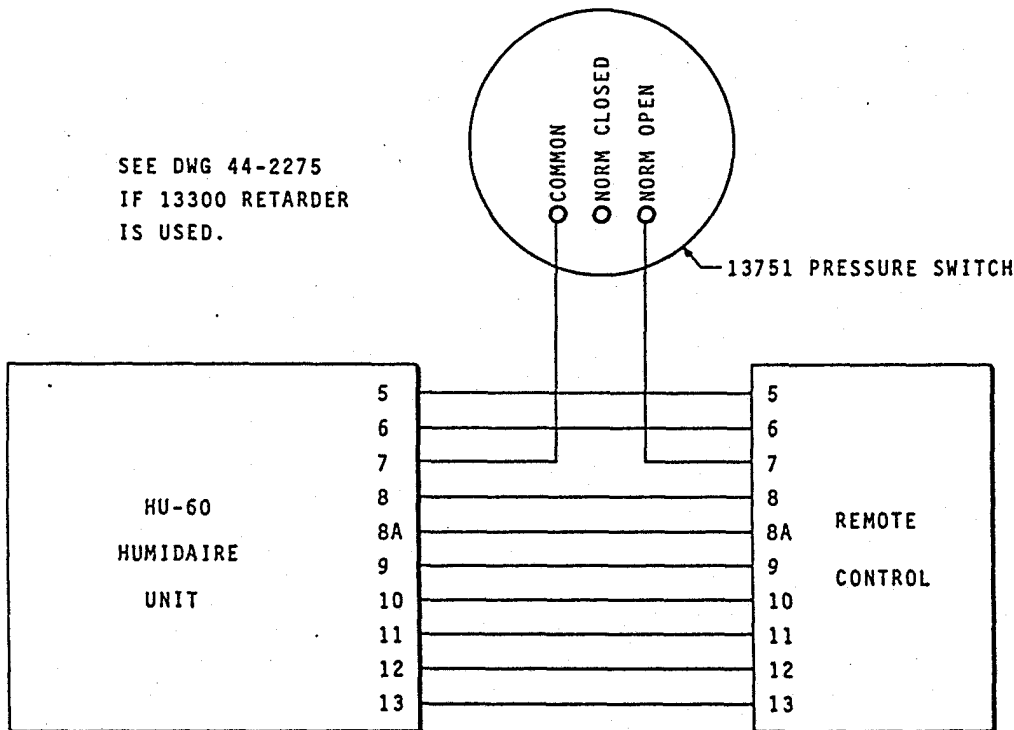
If the adjustment screw has been turned all the way to the left and the contacts still do not close, it may be necessary to change the calibration spring as described in Section 2. Before doing this, make sure the high-pressure port is connected to the high-pressure tap, and that the tubes are not reversed. This can be checked by connecting a sensitive manometer to the tubes in place of the pressure switch and observing the differential pressure when a batt is being condensed and when not. Observe not only which tube has the higher pressure, but that the pressure differential does increase when a batt is being condensed and that its magnitude is greater than the values given in Section 2. If a proper pressure signal is not obtained, re-examine the location of the pressure taps. The high-pressure tap in particular may be subjected to a blast of air which affects its operation.

7. Periodic Maintenance The only maintenance required is to clean the filter screens at the pressure taps once a year. If necessary to blow accumulated dirt out of the pressure sensing lines, DO NOT APPLY COMPRESSED AIR TO THE CONTROL SWITCH. This will rupture its diaphragm.

P A C K I N G L I S T

1	13751	Dwyer Pressure Switch 1823-1
1	13354A	Mounting Bracket for switch
1	13293	50-ft. roll 1/4-inch copper tubing
1	14-2300	Instruction Sheet
		Bag assembly:
2	13294A	Pressure tap and filter assemblies
2	13299	1/4 x 1/8 MPT tube elbow connector
2	10200	1/4 x 1/8 MPT tube connector
1	13298	7/8 Holesaw (Mandrel and saw)
1	13760	Orange spring and label to reduce pressure range of 13751 switch
2		1/4 x 3/4 Hex cap screw
2		1/4 Hex nut

SEE DWG 44-2275  
IF 13300 RETARDER  
IS USED.





TOTAL HEATER CAPACITY MILLION BTU/HR	PIPE LENGTH FEET	RECOMMENDED MINIMUM PIPE SIZES				
		PRESSURE AT SERVICE REGULATOR OR VAPORIZER OUTLET, PSIG				
		NATURAL GAS			PROPANE*	
		6	10	15	10	15
2	100	$\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
	200	$\frac{1}{4}$	1	1	$\frac{3}{4}$	$\frac{3}{4}$
	500	$\frac{1}{2}$	$\frac{1}{4}$	1	1	$\frac{3}{4}$
4	100	$\frac{1}{2}$	$\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{3}{4}$
	200	2	$\frac{1}{2}$	$\frac{1}{4}$	1	1
	500	2	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
8	100	2	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{4}$	1
	200	$2\frac{1}{2}$	2	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{4}$
	500	3	2	2	$\frac{1}{2}$	$\frac{1}{2}$
16	100	3	2	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$
	200	3	$2\frac{1}{2}$	2	2	$\frac{1}{2}$
	500	4	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	2
24	100	3	$2\frac{1}{2}$	2	2	$\frac{1}{2}$
	200	4	3	$2\frac{1}{2}$	$2\frac{1}{2}$	2
	500	5	3	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$

\* OR BUTANE

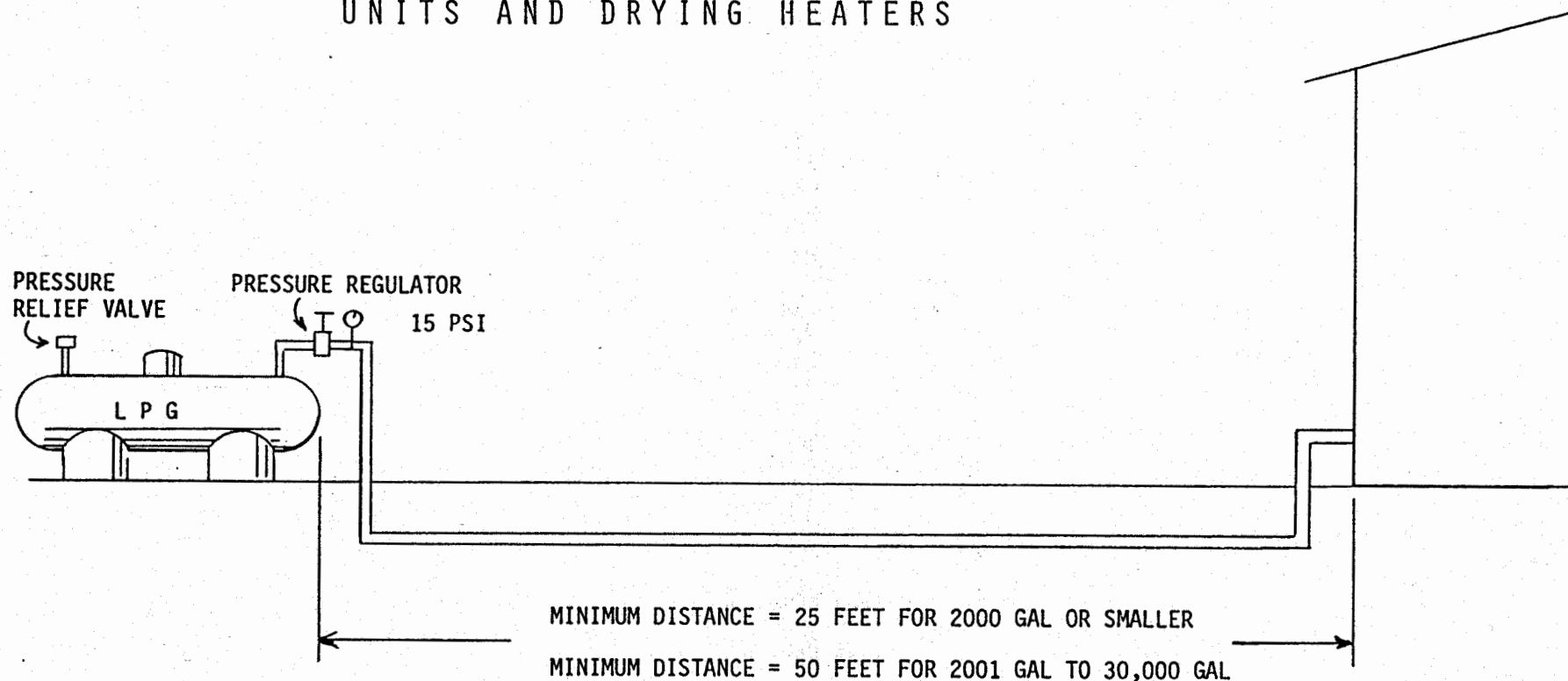
PIPE SIZES ARE NOMINAL DIAMETERS, SCHEDULE 40, AND ARE BASED ON 5 PSIG BEING REQUIRED AT INLETS OF COMBUSTION REGULATORS.



# LIQUEFIED PETROLEUM GAS TANK INSTALLATION FOR HUMIDAIRE UNITS AND DRYING HEATERS

HU-60-1066

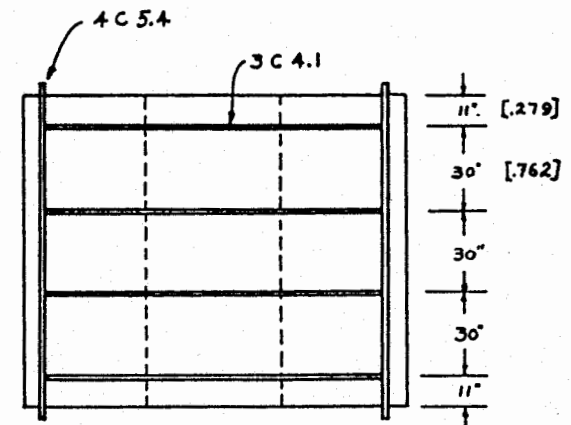
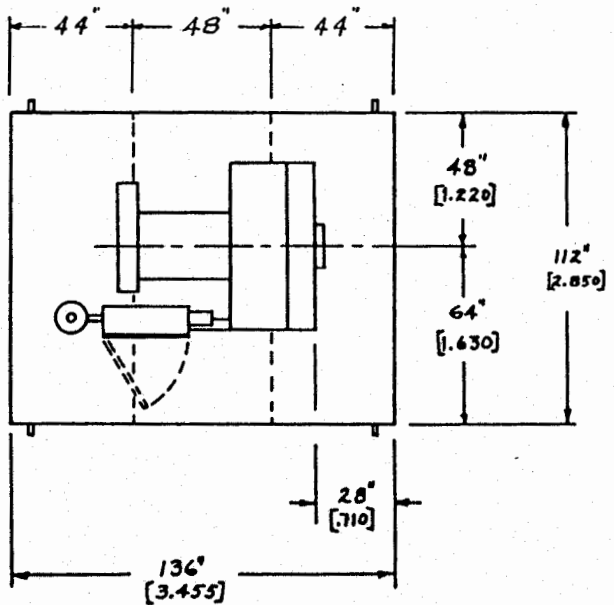
2-10



For LPG installations, the tank should be at least 1200 Gals. (US) to provide adequate surface area to absorb heat of vaporization from the atmosphere so that a vaporizer will not be necessary. To be compatible with the quantity of LPG received in each delivery, a larger tank may be necessary. A battery of small tanks of the desired total capacity has more heat-absorbing area than one large tank.

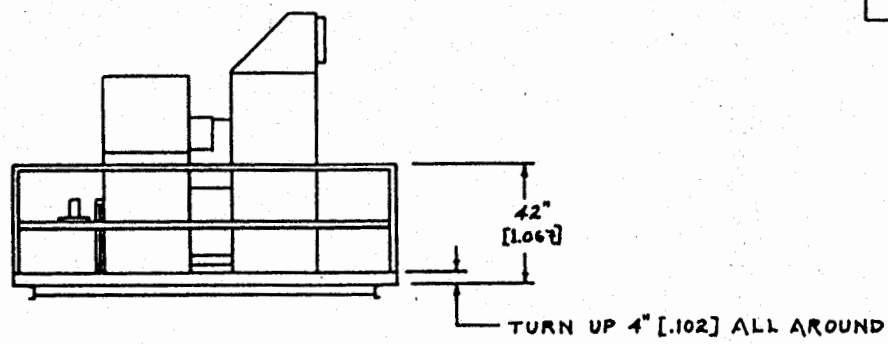
Whether or not a vaporizer is used, make sure that a regulator reduces the pressure to 15 psi (1 bar) BEFORE the pipe goes underground. Otherwise, reliquefaction will take place in the cool earth and cause MUCH trouble. If the gas line in your building feels extremely cold during operation, liquid is in the line and the situation should be corrected IMMEDIATELY.

2-11



BOTTOM VIEW

QUAN.	MATERIAL	SIZE
3	1/8 FLOOR PLATE	4' x 10' [1.220 x 3.048]
2	4 C 5.4 CHANNEL	10'-0" [3.048]
4	3 C 4.1 CHANNEL	10'-0" [3.048]
100'	[30] ANGLE OR TUBE FOR HAND RAIL	



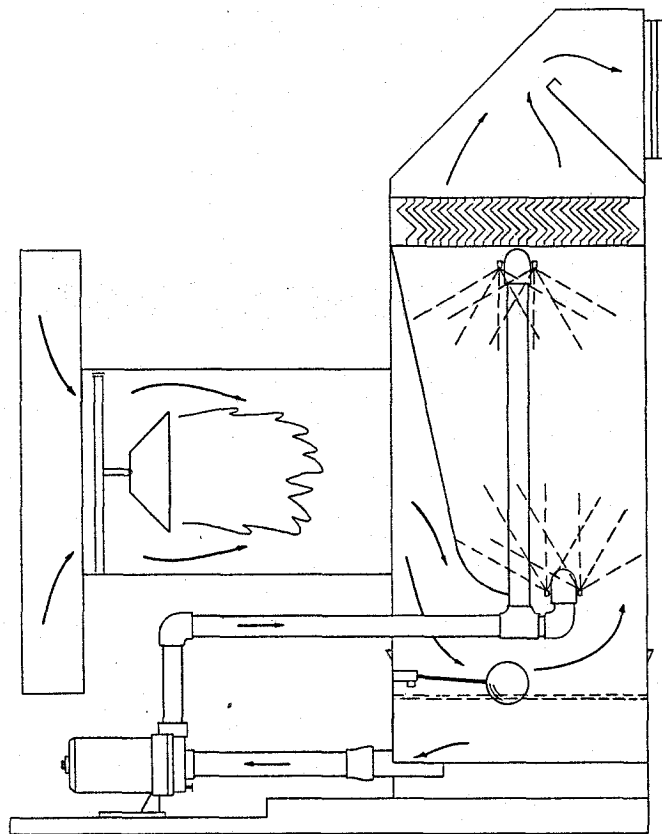
SAMUEL JACKSON MFG. CORP.	
OVERHEAD PLATFORM FOR HU - 60 - 1066 HUMIDAIRE UNIT	
DWN. BY SGJ	DRAWING NO. 14-2290
DATE 4-28-78	

## SECTION 3 --- OPERATION

### HU-60-1066 GAS-FIRED HUMIDAIRE UNIT

#### THEORY OF OPERATION

This unit produces warm, humid air for moistening cotton by drawing the air through a water spray chamber. Since heat is necessary to vaporize the water, the heat is introduced by burning gas in the incoming air stream and allowing the air flow to pull the hot air into the water spray chamber. The hot air vaporizes some of the water, and the water cools the air. This results in warm, humid air. A mist eliminator (zig-zag baffles) at the top of the spray chamber insures that water droplets are removed from the air flow to the cotton because the drops impinge on the baffles.



A modulating motor is incorporated in the gas-fired burner to turn it up and down. The motor is governed by a temperature sensor located in the air discharge hood. This sensor is part of a system designed to regulate and maintain a constant humid air temperature and to prevent over-heating. The desired temperature can be programmed by the set-point dial located in the control cabinet (Ref. 1, page 6-6). The temperature dial is usually set in the range 100 to 120. It is usually set higher for operation in hot weather than in cold.

## SAFETY FEATURES

Several safety features have been added to the burner operation. The burner could over-heat the unit if the airflow were to stop with the burner still in operation. To prevent this, a fan relay in the remote control shuts down the burner the instant the fan is turned off, and an airflow switch (Ref. 31, page 6-6) inside the main cabinet requires that air be actually flowing through the unit when the burner is on. A separate high temperature limit switch (Ref. 30, page 6-6) insures a safe level of heat in the spray chamber.

The four gas solenoid valves are connected in a "double block and bleed" arrangement. The gas must pass first through the safety shut-off valve (SSOV), then through either the pilot or main gas valve. The pipe downstream of the SSOV is vented to atmosphere by a normally-open solenoid valve. This arrangement makes it extremely unlikely that the burner will continue to burn due to foreign matter holding a valve open or other valve malfunction.

## CONTROLS

The Humidaire Unit is usually supplied with a remote manual control, to be installed where it is most convenient for the gin operator. With this control, one can turn on the burner and water pump and, by turning a dial, modulate the water spray pressure up and down. As the dial is turned upward to 100, the highest water pressure, highest relative humidity and highest degree of humidification is obtained.

When humid air is applied at the lint slide grid, a 13290A Condenser Air Switch is usually used. This keeps the water pump turned off until cotton is coming from the battery condenser. Use the controls in the following way: When starting the gin plant, turn on both the burner and water pump and start the humid air fan. Only the burner will come on since the 13290A switch will keep the pump off. This will warm the lint slide grid, the pipes and fan and prevent condensation. When cotton reaches the battery condenser, the water pump will be turned on automatically without any attention from the operator. This preheating procedure is very important in cold weather, otherwise condensation will cause the cotton to stick to the slide.

In gins where the same Humidaire Unit is used at the lint slide and to kill static in the conveyor distributor, the pump switch may have three positions. In the center position, the water pump is off. In the up position, it is on when the 13290A Condenser Air Switch turns it on. In the down position, it is on regardless; allowing the humid air to kill the static at the distributor so that the cotton can get to the condenser.

The 13800 Control is used where the Humidaire Unit supplies air for a final tower dryer, both for humidifying and drying. When only the burner switch is on, the HU-60 burner is automatically modulated to maintain the dryer at the temperature set on the left hand dial. When the water pump is turned on, both the burner and water throttling valve are modulated to maintain the relative humidity set on the right hand dial. Here again, it is advisable to start the gin plant with the burner preheating the tower dryer to avoid condensation.

## SECTION 4

### ADJUSTMENT AND MAINTENANCE

A detailed procedure for adjustment is given on pages 2-3 and 2-4 of the Installation Instructions. Routine adjustment and maintenance procedures are given below.

The most important maintenance procedure is to keep the Humidaire Unit clean. The water tank should be drained daily and all dirt and lint removed from the spray chamber, especially from the water screen. This screen covers the water pump inlet and prevents trash from clogging the pump impeller and spray nozzles. Many gins use two screens so they can be exchanged daily. The screen is available as Part No. 13260.

If the spray nozzles and nozzle header pipes should need cleaning, the nozzles can be unscrewed. Access to the inside of the header pipes is by removing the rubber plugs (Ref. 8, page 6-2). The pipes can be flushed by running the water pump with plugs removed.

To remove scale deposits, put about 10 pounds (5 kilos) of powdered acid in the water and continue to operate the unit. After about a day, the scale will be dissolved. This treatment should be performed at the first sign of scale formation. Powdered acid is available from the factory as Part No. 14000 in 50-pound pails.

Check water bleed-off and adjust in accordance with the last paragraph of page 2-3.

If the water pressure gage (Ref. 45, page 6-2) reads more than about 15 psi on 50 Hz (22 psi on 60 Hz) this is an indication that some nozzles may be clogged. If it reads less, check the water screen, or the water pump impeller may be clogged. To inspect the pump impeller, simply leave the pump bowl connected to the pipes and remove the four cap screws which hold the pump bowl to the adapter cover plate. The motor and impeller can be removed from the pump bowl for inspection.

If water is seen to leak from the space between the motor and pump during operation, the shaft seal needs replacement. See page 4-2 for instruction. Remember, never use a wheel puller on the impeller. Unscrew it from the shaft. Keep the shaft from turning by means of the slot in the motor end of the shaft. Also the sealing surfaces are hard and smooth. Do not scratch or crack them. One is black plastic or carbon. The other is ceramic. One slides on the other, and not on the rubber surface.

At the end of the ginning season, drain the water tank. Drain the pump bowl with the small drain cock (Ref. 16, page 6-6) to keep the pump from rusting or freezing during the off season. Before starting the pump the following year, turn the motor shaft by hand to make sure it is free. Use a stub screwdriver in the slotted shaft end.

Periodically blow lint and dirt out of the pump motor to prevent overheating or even jamming. Late models have totally enclosed fan cooled motors, but the air passages on these also need to be blown out.

Periodically inspect the zig-zag mist eliminator baffles at the top of the spray chamber (Ref. 1, page 6-2). Any accumulation of dirt, lint, or scale on the baffles will impede the airflow and may cause water drops to pass through. It is a good idea to keep a spare mist eliminator assembly on hand, especially where the ginning season is long.

# 13960 AIR INJECTION VALVE

## PURPOSE

In order to control the humidification output of the Samuel Jackson Humidaire Unit, it is necessary to vary the water spray pressure from almost zero up to the maximum the pump will produce. As an improvement over the water throttling valves previously used, we have introduced a system of injecting a small amount of compressed air into the intake of the water pump in order to reduce its output pressure. The 13960 Air Injection Valve (patent applied for) regulates the flow of injected air to produce a stable water pressure.

## PRINCIPLE OF OPERATION

A Honeywell Modutrol motor with a standard valve linkage is mounted on top of the 13960 valve. This motor moves through its stroke in response to the 13800A relative humidity controller or in response to a remote manual control potentiometer. The valve linkage is attached to the valve stem nut 2, and moves the valve stem 3 downward, compressing the spring 6. The compression of the spring causes it to exert more force on the top of the valve shuttle 13 which presses against a Neoprene seal ring 14, which stops the flow of compressed air. The lower section 18 of the valve is connected to the pump outlet water pressure, which presses upward on the Neoprene diaphragm 17. This pressure acts through the pressure plate 16 to push the shuttle 13 up, allowing air to pass.

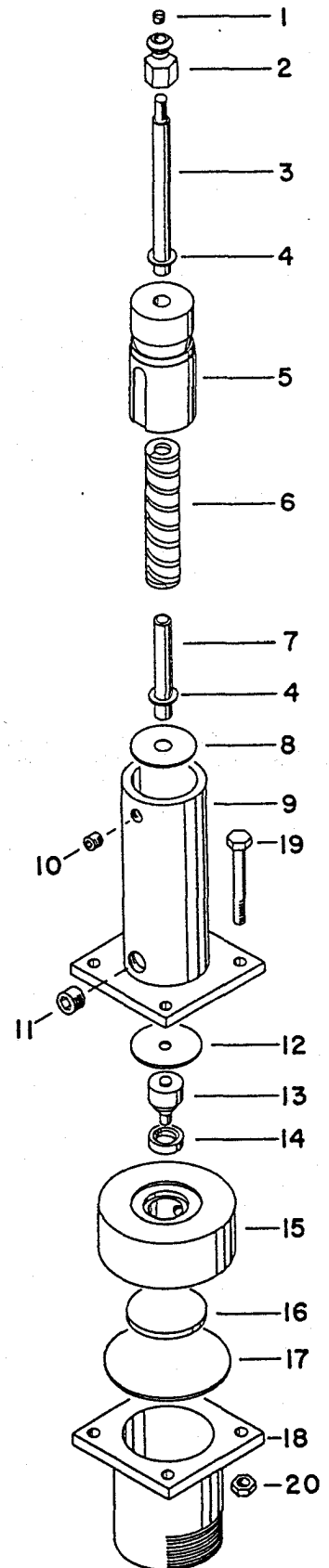
When the water pressure force exceeds the spring force, the shuttle will be lifted to admit enough compressed air to lower the water pump pressure to the desired level. In this way, the water pressure on the spray nozzles is proportional to the stroke of the Modutrol motor.

The compressed air filter and regulator is located inside the cabinet of the Humidaire unit. A pressure of 7 to 10 psi applied to the 13960 valve is usually satisfactory. When the water pump is turned off, the spring should force the shuttle firmly closed, stopping the flow of compressed air.

To adjust the valve, the Modutrol motor should be run to its upper or open position. Loosen the set screw 10 and raise or lower the entire motor-linkage assembly until the water pressure is about 1 or 2 psi. Tighten set screw.

1	13449	Set Screw	11	13975	Socket pipe plug
2	13448	Valve stem nut	12*	13970A	Upper Diaphragm
3	13979	Valve stem	13*	13966	Valve shuttle
4	13745	Klipring (2 req.)	14*	13968	Seal ring
5	13980	Actuator mounting stub	15	13965	Valve Body
6	13986	Spring, 4½"	16	13967	Pressure Plate
	13987	Spring, 5"	17*	13969	Lower Diaphragm
7	13978	Lower push rod	18	13961	Lower Section
8*	13977	Felt washer	19	15720	¼ x 2 Screw (4 req.)
9	13972	Flanged sleeve	20	15701	¼ nut (4 req.)
10	13976	Socket set screw			

\* Recommended spares



## SECTION 5 -- TROUBLESHOOTING HU-60-1066

<u>PROBLEM</u>	<u>POSSIBLE CAUSES AND REMEDIES</u>	<u>REF/PAGE</u>
1. Humidaira Unit completely dead	Humid air fan not on.	
	Air flow choked off.	
	Air flow switch not functioning. If not, drain any condensed water from tube leading to spray chamber, then make sure drain cock is closed. Make sure tube is not clogged.	31/6-6
	Electric power supply off.	
	5-Ampere fuse blown.	3/6-6
	Perform voltage check shown on page 5-2	
2. Burner will not light	See if problem 1 applies.	
	Press reset button on protectorelay.	4/6-6
	Check incoming gas pressure, at least 3 psi	11/6-6
	See if Terminal 6 is energized.	
	See if "L" relay in Protectorelay pulls in.	4/6-6
	If not, see if flame electrode is grounded. Or its wire burnt and grounded.	8/6-4 11/6-4
	If so, see if spark plug is sparking. Check spark gap at 1/16-inch (1.5 mm). Check for carbon on spark plug due to bad fuel gas or low air inlet velocity. If no spark, jiggle "F" relay. Normally closed contacts for ignition might be bad.	7/6-4 4/6-6
3. Burner goes off and relights	Air flow switch adjustment	/2-4
	Low voltage may affect protectorelay.	
	Flame electrode may be coated. Scrape it.	8/6-4
	Flame may not be contacting flame electrode. Bend it outward, or install 4" long burner nipple.	/2-4 12/6-4
4. Burner lights, but will not modulate.	Low gas pressure due to taking gas supply from low-pressure regulator. Check incoming gas pressure, at least 3 psi.	11/6-6
	Defective gas Modutrol Motor or cover transformer.	24,21/6-6
	Temperature set-point dial should be between 100 and 120.	1/6-6
	Defective main gas solenoid valve.	10/6-6

CONTINUED ON PAGE 5-4

PROBLEM

POSSIBLE CAUSES AND REMEDIES

REF/PAGE

5. Water pump will not run

See if problem 1 applies.

Where condenser air switch control is used, cotton may not be coming from battery condenser.

Motor end of water pump shaft is slotted. Using stub screwdriver, see if it turns freely. If not:

- A. Blow lint and dirt from motor.
- B. Check for rust and scale jamming pump impeller in pump bowl. Inspect per page 4-4.
- C. If shaft still is not free, check motor armature and bearings.

Press reset button on motor starter.  
Check that all three phases of power are present. One fuse might be blown in distribution panel.

6/6-6

6. Water in humid air coming from unit--

As condensation

System should be preheated. See "Controls" page 3-2.

Air flow from Humidaire unit choked down too much.

Cold air may be blowing on uninsulated pipes.

Not as condensation

Mist eliminator clogged with lint or scale.

Air hood internal baffle assembled backwards.

Fig 1/2-1

7. Not enough humidification

Low water pressure, See Problem 8 below.

Water spray nozzles may be clogged. High water pressure indicates this problem.

Too much air being drawn from Humidaire unit.

Air not being properly applied to cotton.

Not enough heat input. See Problem 4 above.

Bad air distribution in water spray chamber. New 13910 inlet air deflector improves efficiency.

3/6-2

8. Water pressure not normal

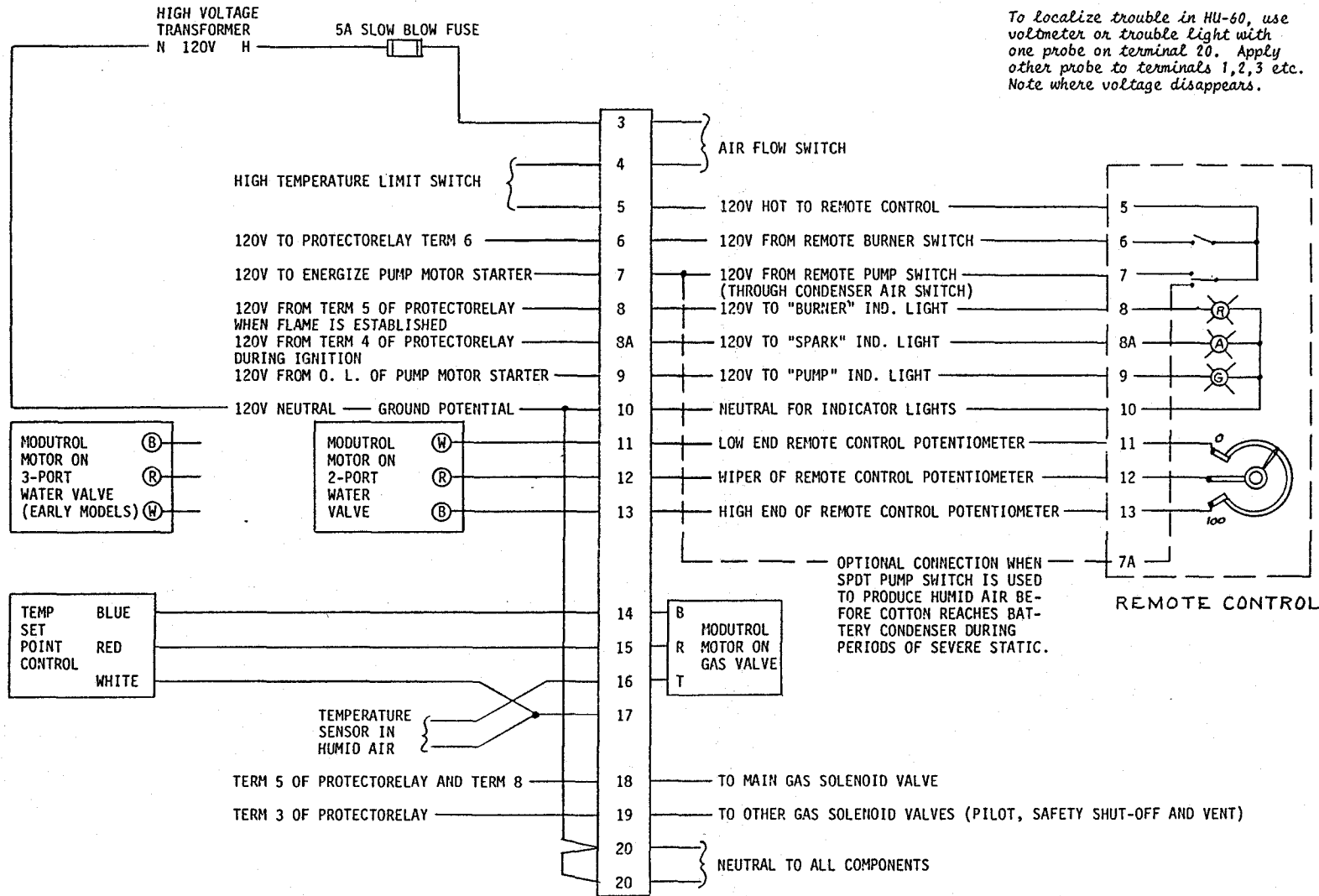
See 6th paragraph, page 4-1.

Check for air leak on suction side of water pump.

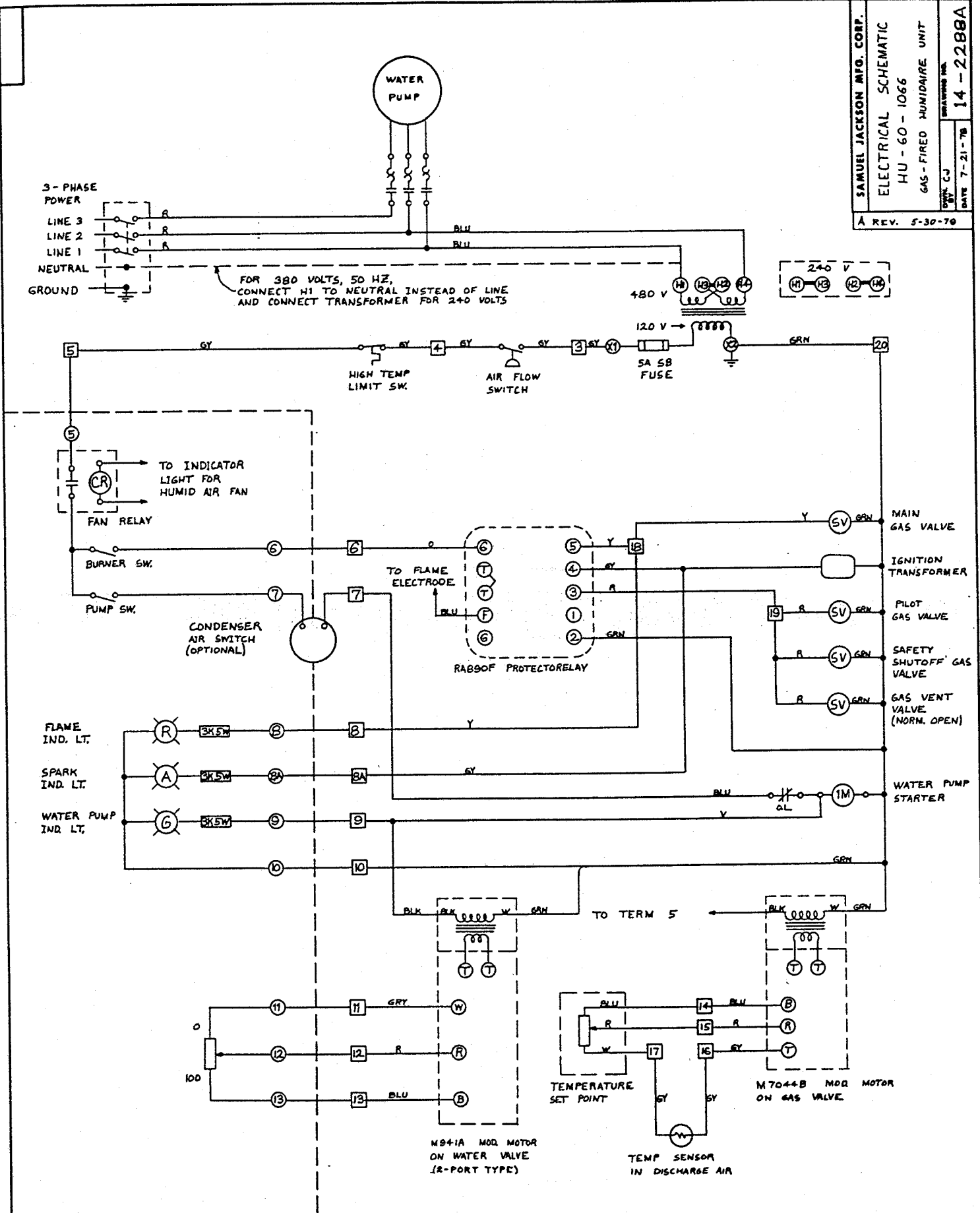
Water level in tank may be so low that water pump sucks air.

Water pump may be running backwards.





USING TERMINAL STRIP TO TROUBLE-SHOOT HU-60-1066 HUMIDAIRE UNIT

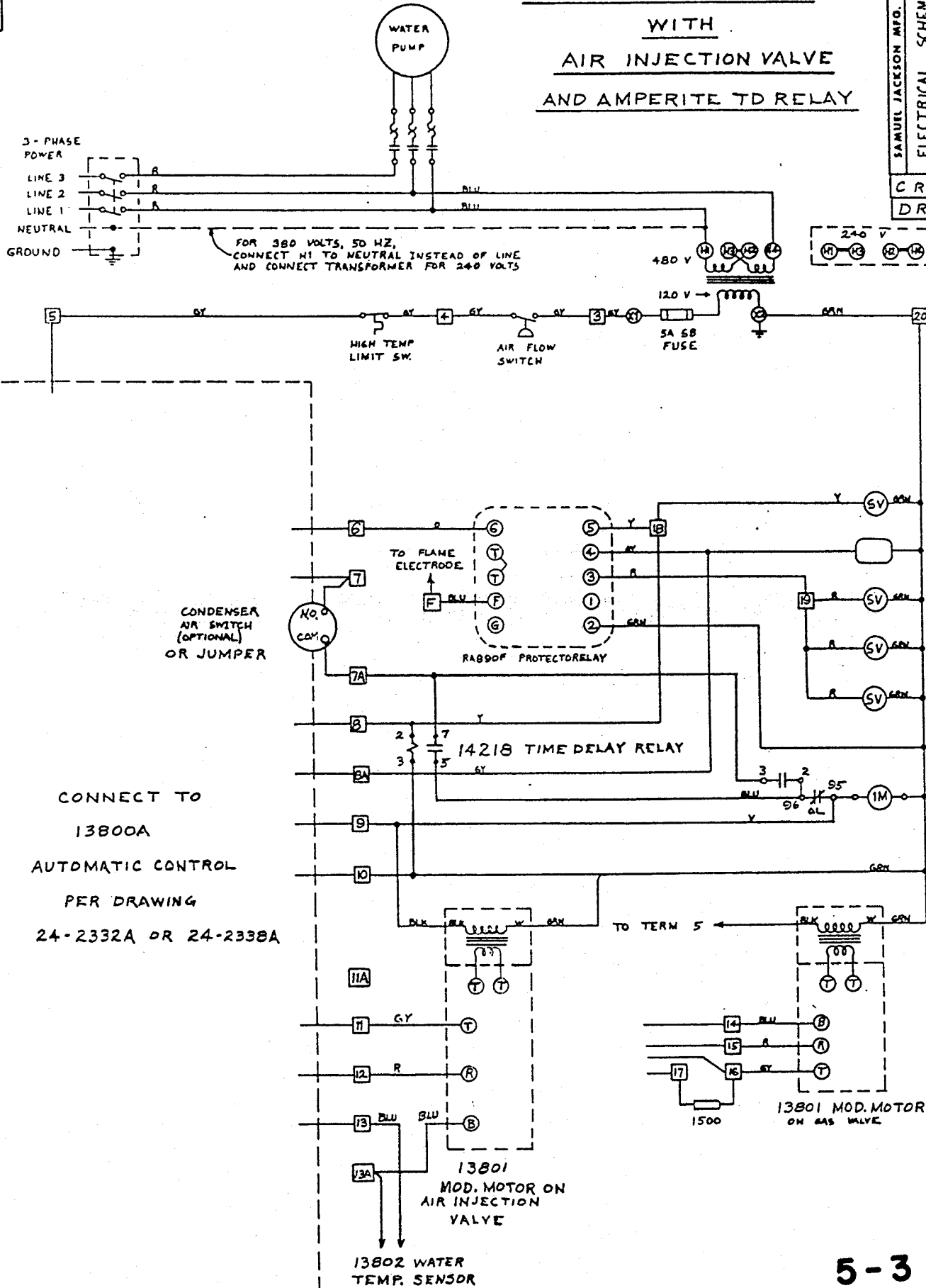


REMOTE MANUAL CONTROL

HUMIDAIRE UNIT

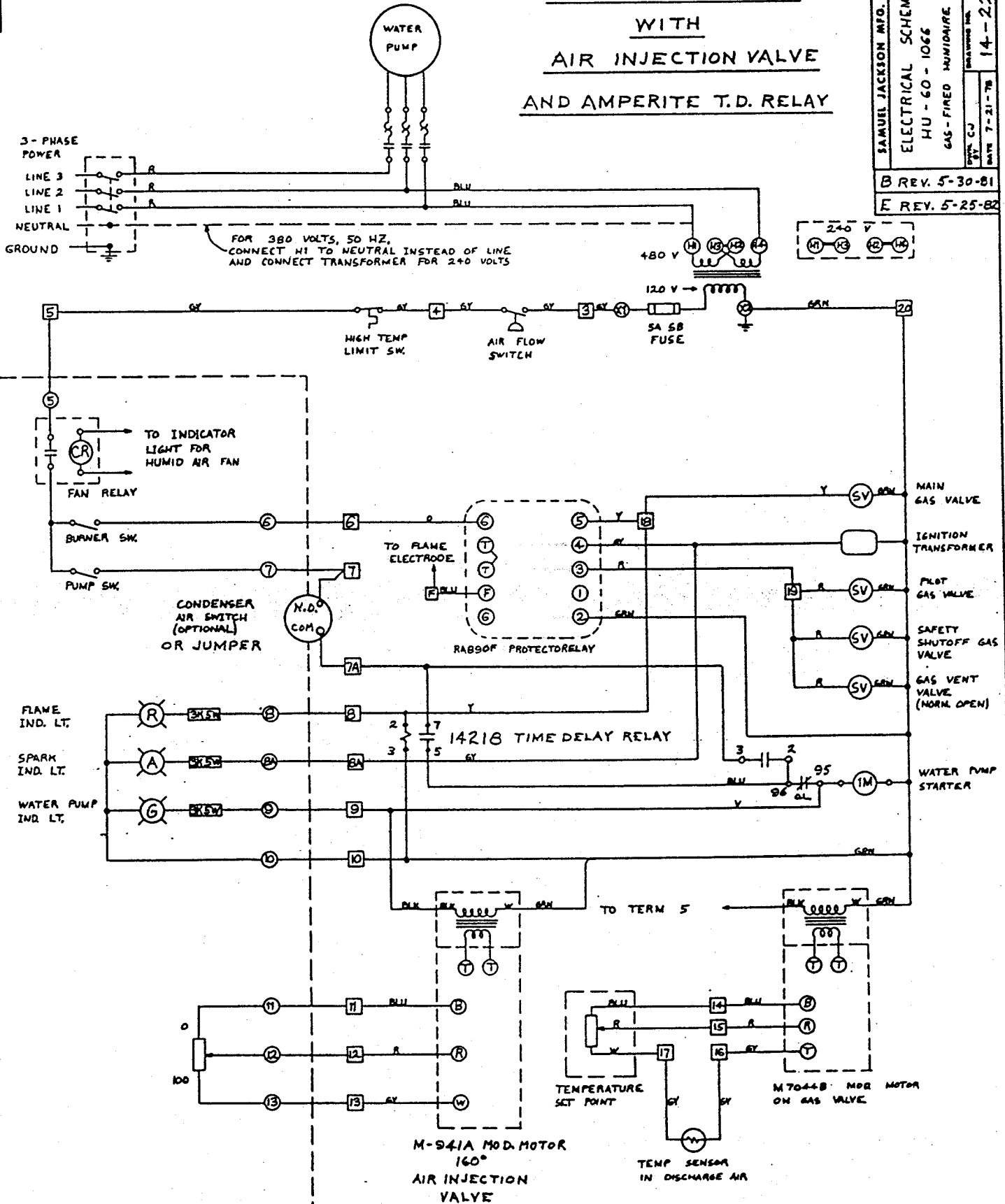
# AUTOMATIC CONTROL WITH AIR INJECTION VALVE AND AMPERITE TD RELAY

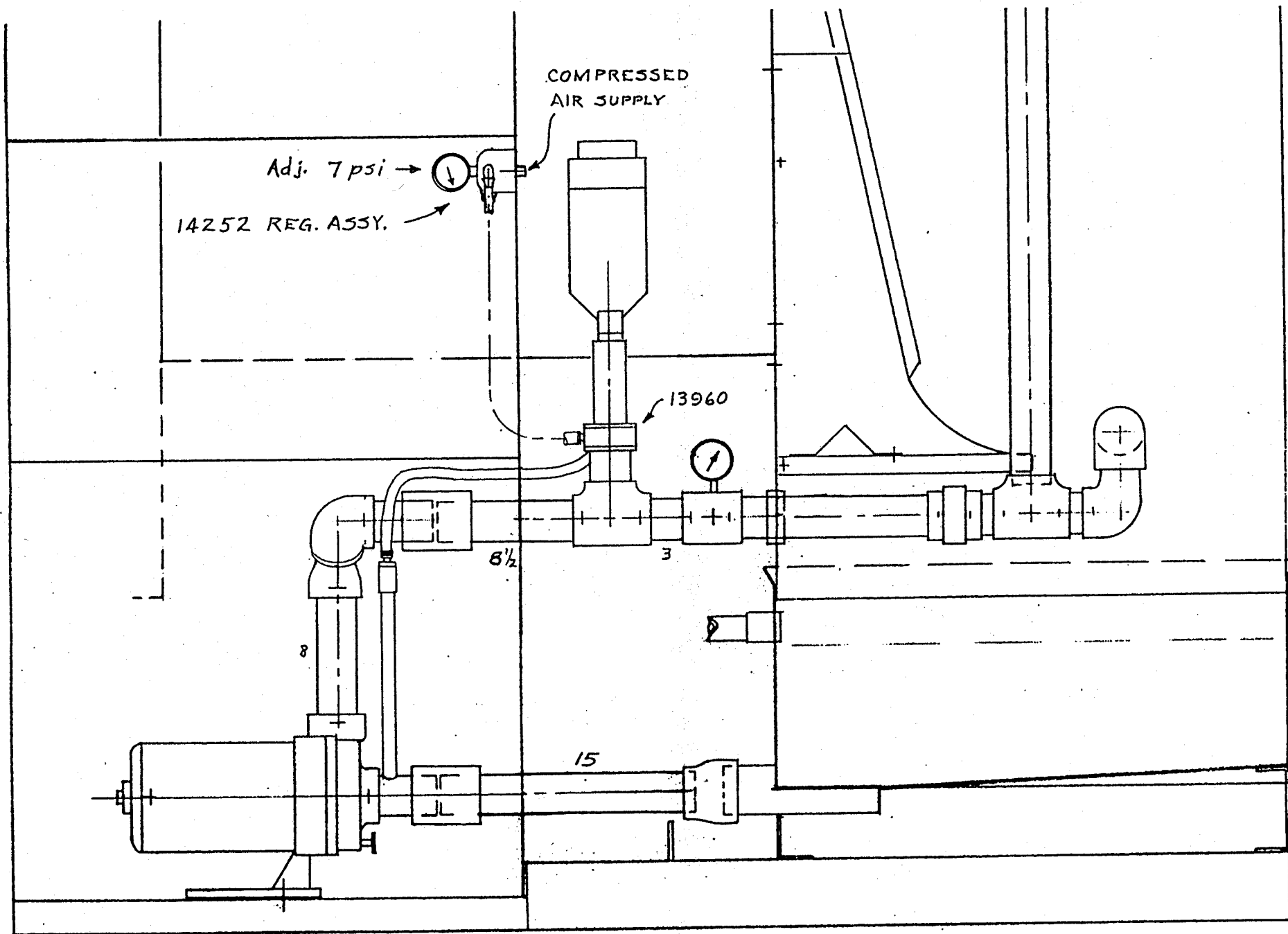
SAMUEL JACKSON MFG. CORP.  
 ELECTRICAL SCHEMATIC  
 HU - 60 - 1066  
 GAS-FIRED HUMIDIFIER UNIT  
 DATE 7-21-78  
 14-2288D  
 C REV. 5-30-81  
 D REV. 4-23-92



# MANUAL CONTROL WITH AIR INJECTION VALVE AND AMPERITE T.D. RELAY

SAMUEL JACKSON MFG. CORP.  
 ELECTRICAL SCHEMATIC  
 HU - 60 - 1066  
 GAS-FIRED HUMIDIFIER UNIT.  
 DATE 7-21-78  
 14-2288E  
 B REV. 5-30-81  
 E REV. 5-25-82





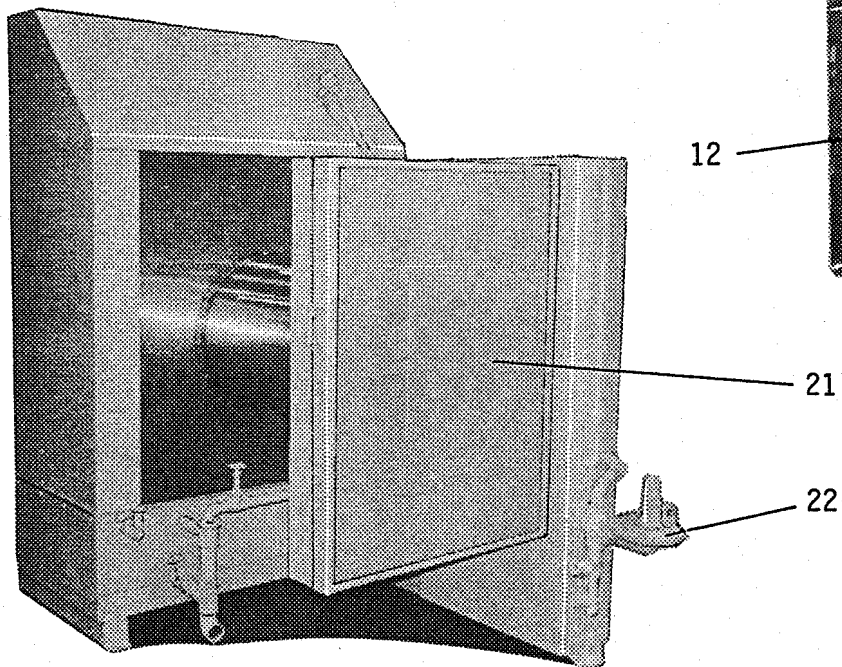
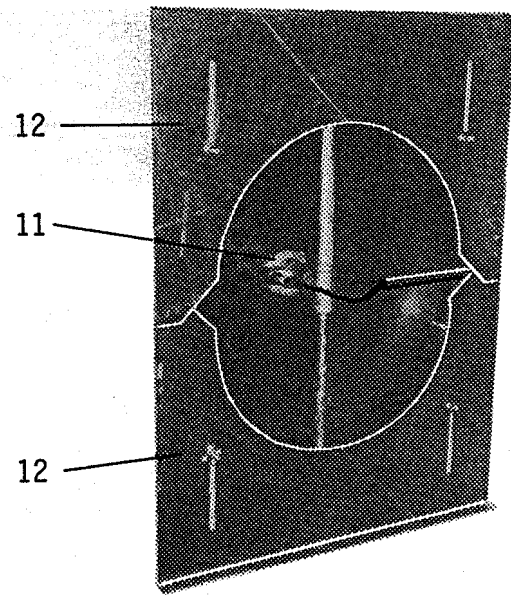
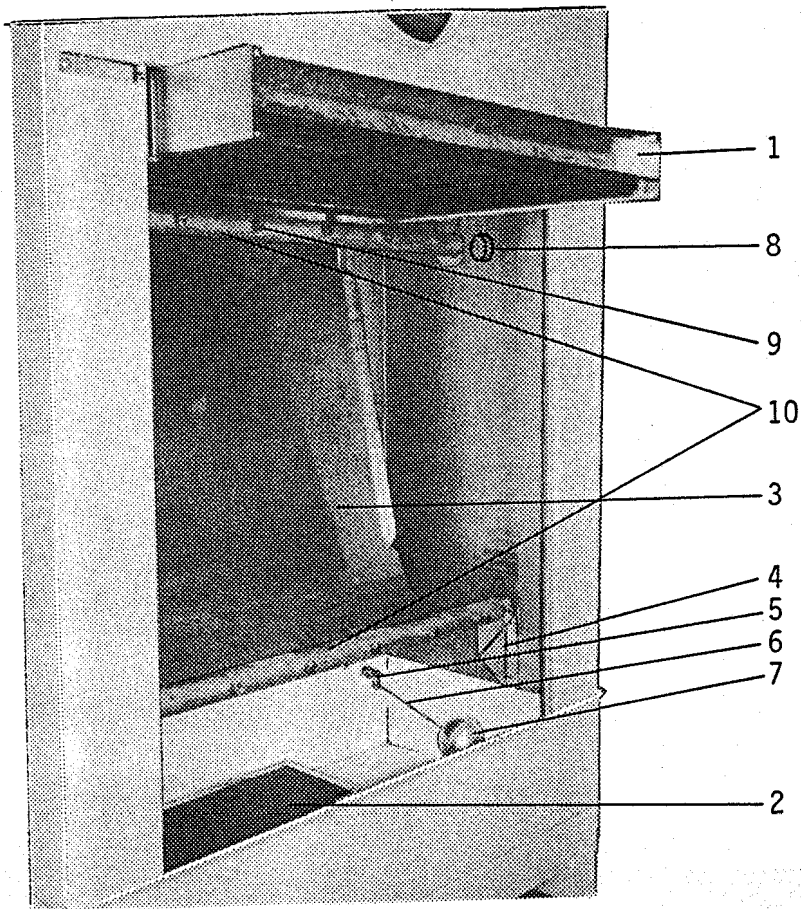
AIR INJECTION SYSTEM FOR HU-60-1066 HUMIDAIRE UNIT

# SECTION 6 -- REPAIR PARTS

## LIST OF SPARES FREQUENTLY ORDERED FOR HU-60-1066 GAS-FIRED HUMIDAIRE UNIT

QUAN. PER HU-60	PART NO.	NAME
	14000	Powdered Acid Descaler, 50 pound pail
1	13920	2 HP water pump and motor
1	11261	Shaft seal for water pump
1	11251	Body gasket for water pump
1	12328	Protectorelay, RA 890F
1	12398	Spark plug, I-64-1
1	12399	Flame electrode, FRS-2-6
1	11277A	Water pressure gage, 0-30 psi (for 50 HZ) (on 60 HZ power, use 11277B gage, 0-60 psi)
1	13260	Water tank screens
1		Mist eliminator, choose from following:
	12150A	galvanized, knocked down
	12150B	galvanized, assembled
	12150C	stainless, knocked down
	12150D	stainless, assembled
24		Water spray nozzle (24 per set) choose from following:
	11079	brass
	13900	stainless steel
4	13245	Rubber seal for 2" Dresser coupling
4	13246	Metal seal ring for 2" Dresser coupling
1	11168	Transformer, High V to 120 V
3	11227	Lamp for indicator lights, 327
1	12377	Fuse, 3AG-5A Slow Blow
1	11278	Gas pressure gage, 0-5 psi
1	13750	Air flow switch, 1823-0
2	12333	Cover transformer for Mod Motors
1	12332	Modutrol Motor, M941A
1	13435	Modutrol Motor, M7044B (For Manual Control Models)
1	13436	Temperture Sensor
1	11070	Float Valve
1	11069	Rod for float valve
1	11068	Float ball
2	13488	Rubber plug for nozzle header, 2-in.
1	13909	Spark plug wire
1	13908	Flame electrode wire

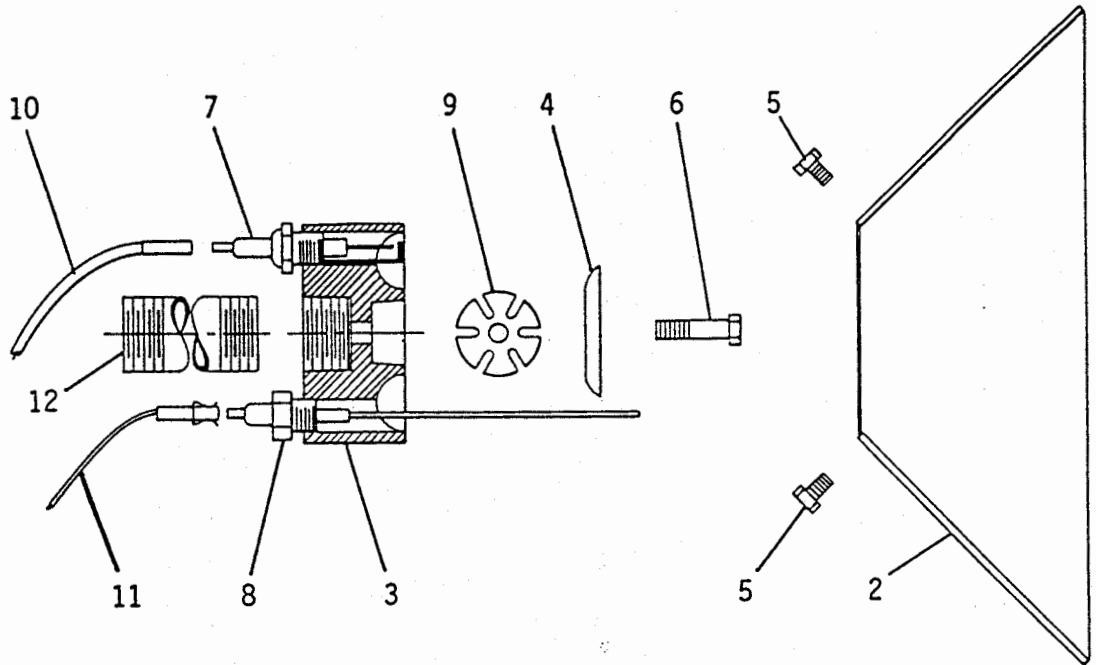
Repair kits and coils for gas solenoid valves  
see page 6-8



HU-60-1066 GAS-FIRED HUMIDAIRE UNIT

<u>Ref.</u>	<u>Quan.</u>	<u>Part No.</u>	<u>Description</u>
1	1		Mist eliminator
		12150A	Galvanized, knocked down
		12150B	Galvanized, assembled
		12150C	Stainless, knocked down
		12150D	Stainless, assembled
2	1	13260	Water tank screen
3	1	13910	Air inlet deflector (should be used to replace all preceding types).
4	1	13467A	Header pipe support (For SN 4621 up, or where modified per Supplemental Bulletin 8-2)
5	1	11070	Float valve
6	1	11069	Rod for float valve
7	1	11068	Float ball
8	2	13488	Rubber plug for nozzle header, 2-inch
9	24		Water spray nozzles
		11079	Brass
		13900	Stainless steel
10	2		Nozzle header pipe
		13469	Galvanized
		13469A	Stainless
11	1	13480	Burner head assembly, complete
12	2	13492	Burner air shutter
21	1	13530	Air intake screen
22	1	11777	Gas pressure regulator





<u>REF.</u>	<u>QUAN.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
	1	13480	BURNER HEAD, COMPLETE WHICH CONSISTS OF:
2	1	13482	BURNER CONE
3	1		BURNER BODY
4	1	12985A	CONTOURED DISC
5	4	13483	5/16 X 1/2 HX HD CAP SCREW SS
6	1	13490	3/8 X 1-1/2 HX HD CAP SCREW SS
7	1	12398	SPARK PLUG, I-64-1
8	1	12399	FLAME ELECTRODE, FRS-2-6
9	1		BURNER ORIFICE DISC:
			<u>SLOT</u> <u>THICK</u> <u>FLOW AREA</u>
		13006	1/8    .048    23
		13007	1/8    .060    29
		13008	1/8    .075    36
		13001	1/4    .048    46
		13002	1/4    .060    58
		13003	1/4    .075    73
		13004	1/4    .150    145
			PARTS NOT INCLUDED IN 13480 BURNER HEAD:
10	1	13909	SPARK PLUG WIRE
11	1	13908	FLAME ELECTRODE WIRE
12	1	13922	1-1/4 X 4 BLACK PIPE NIPPLE (THIS LENGTH FIRST USED ON SN 4621. RECOMMENDED FOR ALL PREVIOUS UNITS.)

## GAS PIPING

Size of pipe supplying gas to heaters and other appliances should be large enough to prevent excessive pressure losses when all of them are in use. See following Table of sizes, flows and pressure losses.

Where LPG (Liquefied Petroleum Gas, Propane, Butane) is used as the fuel, see following drawing which shows recommended practices.

Emergency shut-off valves should be provided to permit turning off the fuel in an emergency. They should be located so that they are accessible in an emergency situation.

IRI (Industrial Risk Insurers) and some state and local authorities require venting the gas regulator and normally-open vent valve. NFPA 86\* states:

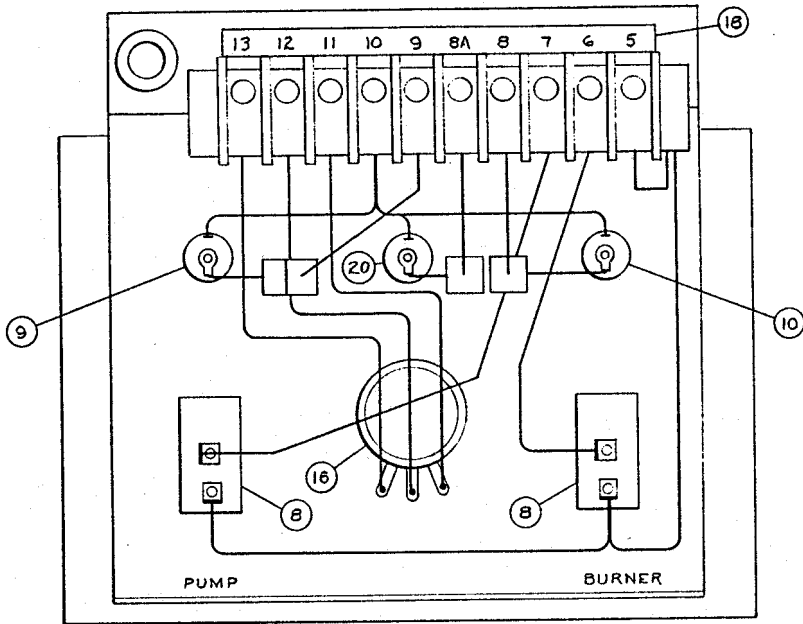
3-3.4.3.2 Regulators shall be vented to a safe location, where vented gas cannot re-enter the building without extreme dilution. The terminating end shall be protected against water entry and bug-screened. Vent pipe shall be of adequate size so as to not lengthen response time.

3-3.4.3.3 Vent lines from multiple regulators, where manifolded together, shall be piped in such a manner that diaphragm rupture of one will not backload the others.

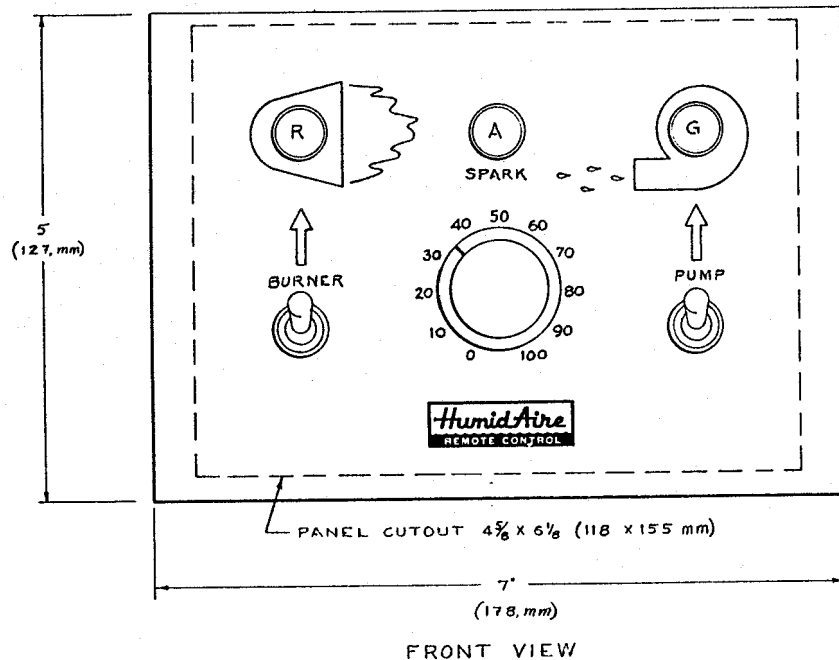
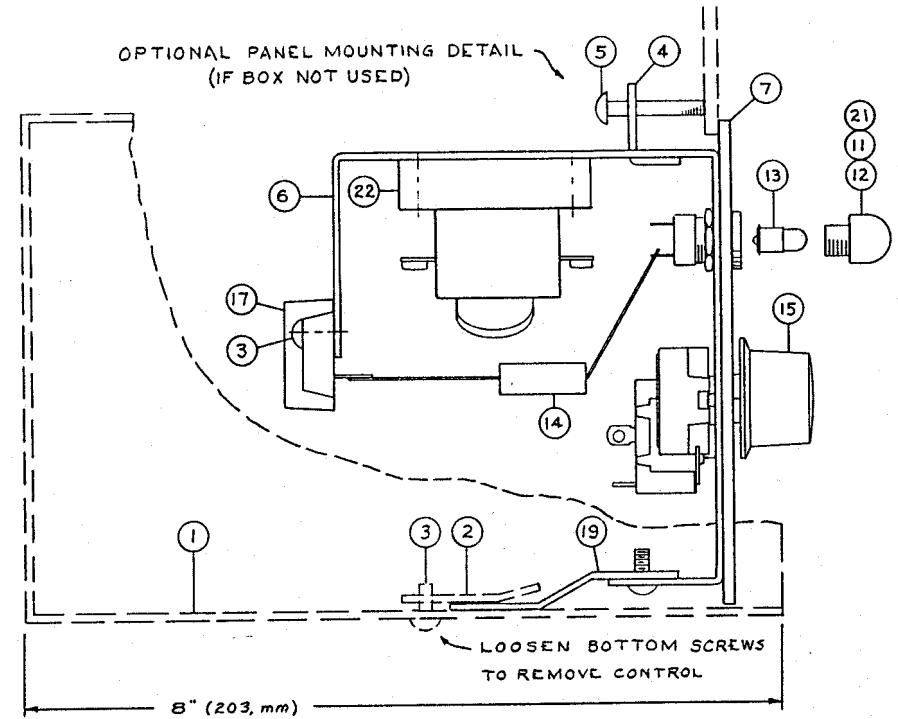
3-3.4.3.4 Vents from gas pressure switches, but from no other devices, may be vented into the regulator vent lines provided that switch or regulator diaphragm failure will not backload the regulator.

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REAR VIEW

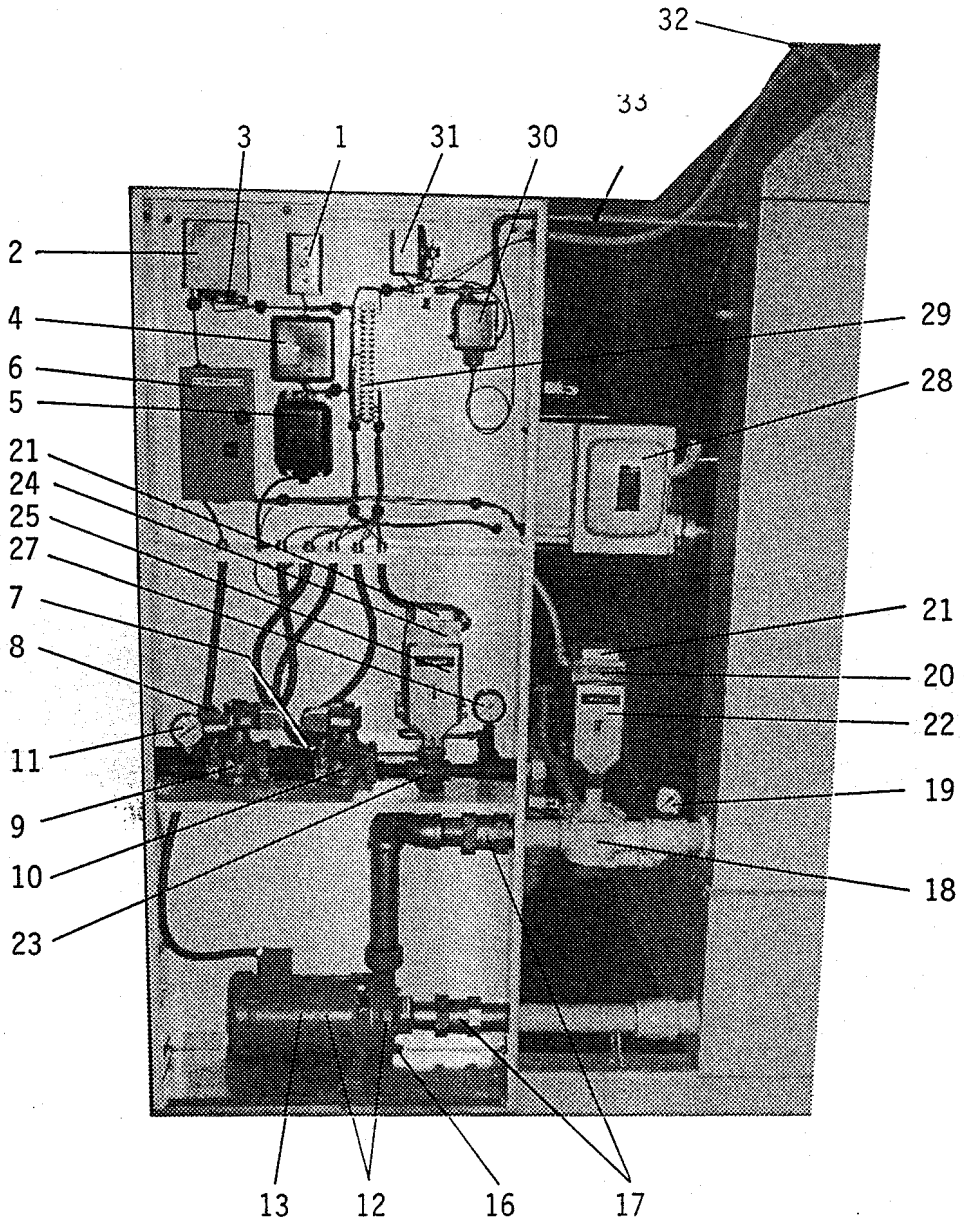


FRONT VIEW

Ref. No.	Quan.	Part No.	Description
1	1	12401	Remote Control Box
2	1	11609	Clamp
3	8		8-32 x 3/8 RH machine screw
4	2	11666	Panel Clamp
5	2	11669	8-32 x 1 RH machine screw
6	1	13305	Internal Bracket
7	1	12465A	Face Plate Assy
8	2	11229	Toggle Switch, SPST
9	1	11673	Green Indicator Light, complete
10	1	11675	Red Indicator Light, complete
11	1	11674	Green lens
12	1	11676	Red lens
13	2	11227	327 lamp
14	3	11320	Resistor, 3000-ohm, 5 W
15	1	11672	Pointer knob
16	1	11239	Potentiometer, 135-ohm, 2 W
17	1	12784	Terminal Strip, 10-141 Y
18	1	12963A	Number Strip, 5-13
19	1	13306	Clamp Tongue
20	1	10098	Amber Indicator Light, complete
21	1	10099	Amber lens
22	1		Fan Safety Relay, with:
		13149	120/60, 110/50 coil
		13150	240/60, 220/50 coil
		13151	480/60, 440/50 coil

Discard Part 19 when mounting in panel.

SAMUEL JACKSON MFG. CORP.	
12400A	
REMOTE MANUAL CONTROL	
HU-60	
DWN. BY 5GJ	DRAWING NO. 10-12400A
DATE 5-27-74	



HU-60-1066 GAS-FIRED HUMIDAIRE UNIT

<u>Ref.</u>	<u>Quan.</u>	<u>Part No.</u>	<u>Description</u>
1	1	13423	Temperature set point control
2	1	11168	Transformer, High V to 120V
		13308	Transformer Cover
3	1	12377	Fuse
		13424	Fuseholder
4	1	12328	Protectorelay, RA890F
5	1	11172	Ignition Transformer
6	1	13758	Motor Starter
*7	1	13434	Gas Pilot Valve
*8	1	13433	Gas Vent Valve
*9	1	13438	Safety Shut-off Valve
*10	1	13438	Main Gas Valve
11	1	13439	Gas Pressure Gauge (15 psi)
12	1	13920	Water pump with motor
13	1	13540	Motor for pump/specify voltage
		11251	Body gasket for pump
		11261	Shaft seal for pump
16	1	13363	Drain cock for pump
17	2	10720	Dresser coupling, complete
	4	13246	Steel cup ring
	4	13245	Rubber Seal
18	1	13830	Water valve, 2-port for late models
		13500	Water valve, 3-port for early models
19	1	11277A	Water pressure gauge (0-30 psi for 50 HZ)
		11277B	Water pressure gauge (0-60 psi for 60 HZ)
20	1	12332	Modutrol Motor, M941A
21	1	12333	Cover Transformer
22	1	13442	Valve linkage, Q618A1008
23	1	12338	Valve Body
24	1	13435	Modutrol motor, M7044B
25	1	12334	Valve linkage, Q618A1016
27	1	11278	Gas pressure gauge (5 psi)
28	1	13202	Disconnect Switch
29	20	11186	Wire Terminals
	1	11187	Terminal end
30	1	12320	HI Temp Lim Switch
31	1	13750	Air Flow Switch
32	1	13436	Temperature Sensor
33	1	13486	Tube for Air Flow Switch

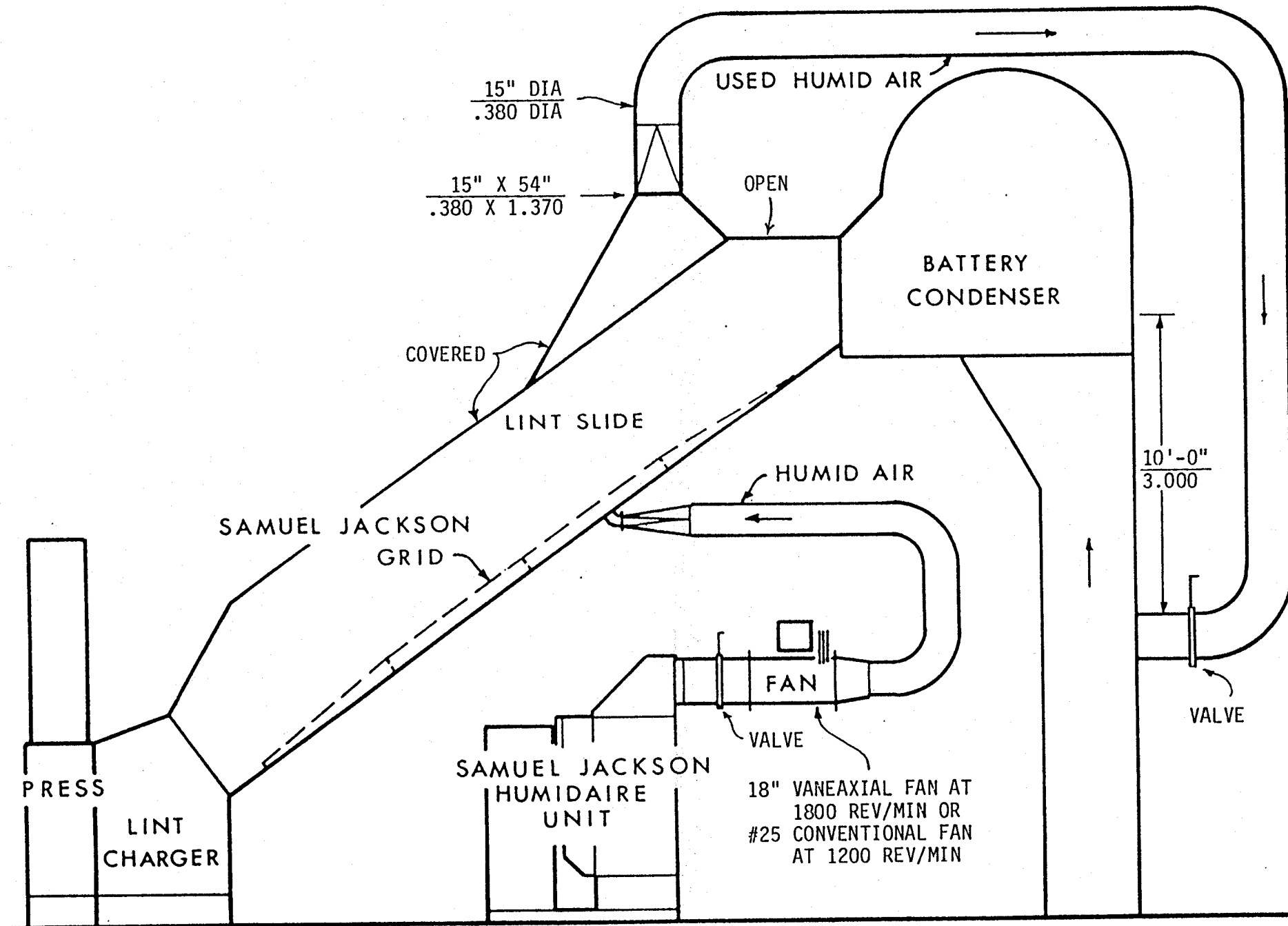
\* See page 6-8 for gas solenoid valve coils and repair kits.

ASCO Valves used on HU-60 Gas-fired Humidaira Units  
(All Coils 120/60 110/50)

MODEL	SERIALS	YEARS	DESCRIPTION	PORT	VALVE	REPAIR KIT	COIL
1053	3851-3979	69-71	MAIN, ALUM, DIAPH	1	12341/8215A50	13513/103-228	13511/96-817-1-D
			PILOT, ALUM, DIAPH	1/2	12342/8215B20	13517/158-398	13516/27-462-1-D
1053A	4000-4049	74	MAIN, BRASS, DIAPH	1	12341A/8210B54	13518/168-385	13511/96-817-1-D
			PILOT, BRASS, ANGLE	1/2	12342A/8030A17	13519/103-019	13511/96-817-1-D
1053B	4252-4301	75	MAIN, ALUM, DIAPH	1 1/4	13214/8215A60	13513/103-228	13511/96-817-1-D
			PILOT, BRASS, ANGLE	3/8	13213/8030B13	13520/158-562	13516/27-462-1-D
1066	4440-4592	77-79	MAIN & SSOV	1	13438/J8215A50	13513/103-228	13511/96-817-1-D
			N.O. VENT	3/4	13433/J821533	13514/162-218	13511/96-817-1-D
			PILOT	3/8	13434/J8040B8	13515/180-660	13512/96-619-1-D
1066	4621-	80	MAIN & SSOV	1	13438/J8215B50	13852/208-441	13511/96-817-1-D
			N.O. VENT	3/4	13433/J8215A33	13853/208-754	13854/27-462-1-D
			PILOT	3/8	13434/J8040B8	13515/180-660	13512/96-619-1-D

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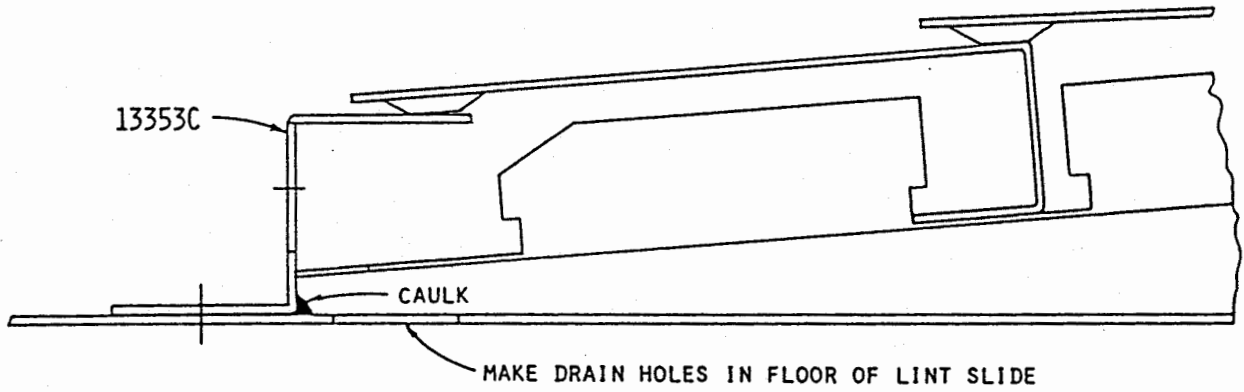
<b>SAMUEL JACKSON MFG. CORP.</b>	
HU-60 GAS SOLENOID VALVES	
DWN. BY SGJ	DRAWING NO. 24-2269



LINT SLIDE GRID INSTALLATION

14-2355

INSTALLATION OF 13353 C BOTTOM GRID CLOSURE



GRID INSTALLATION IN LUMMUS SLIDE

