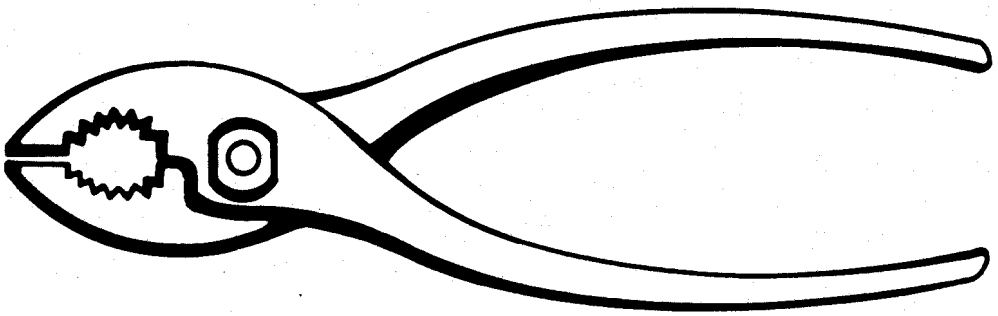
SERVICE MANUAL

HU-60-1105B
KEROSENE-FIRED
HUMIDAIRE UNIT
WITH 14800B CONTROL



SAMUEL JACKSON MANUFACTURING CORP.

LUBBOCK, TEXAS 79490

TABLE OF CONTENTS

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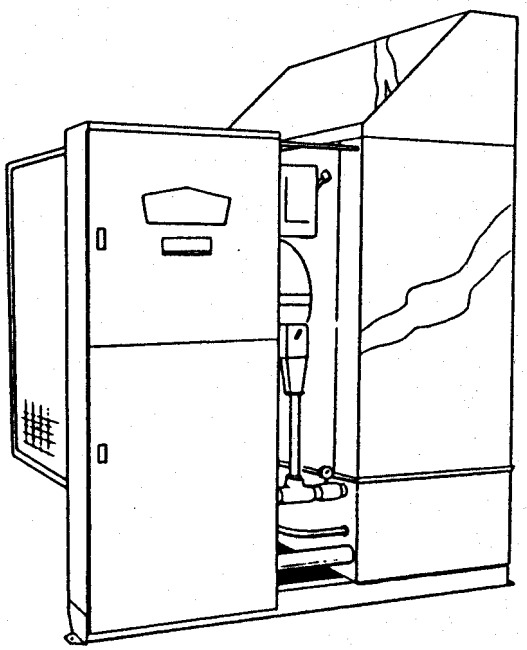
KEROSENE-FIRED
HUMIDAIRE UNIT



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-60-1105B Humidaire Unit produces warm humid air by heating the air with an oil burner, then passing it through a water spray chamber. The oil burner operates on aviation jet fuel or kerosene (gas/oil) of low sulfur content 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 4 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 cotton.

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

The HU-60 is usually regulated from a remote automatic control station which has switches and indicator lights for the burner and water pump and a dial to increase or decrease the output of the unit.

SPECIFICATIONS

At full throttle and 2500 cfm air delivery:

Burner input capacity	2,000,000 Btu/hr
Kerosene consumption	14 US gal/hr, 53 LPH
Water evaporation	180 US gal/hr, 680 LPH
Length	8 geet, 244 cm
Width	5 feet, 153 cm
Height	8 feet, 244 cm

Utilities Requirements:

Minimum Water pressure	20 psi, 1.4 bars
Compressed Air	75 to 150 psi, 5 to 10 bars

Standard electrical power:
380 volt, 3 phase, 50 HZ
440 volt, 3 phase, 60 HZ

Water drainage facilities must be provided for.

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

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. The two Humidaire Units and several methods of applying the humid air are described below.

HUMIDAIRE UNITS

There are two Humidaire Units, both of the same size and capacity. The HU-60-1106 Gas-Fired Humidaire Unit is used wherever natural gas, propane or butane can be economically obtained. The HU-60-1105 Kerosene-Fired Humidaire Unit burns kerosene (gas-oil) or aviation jet fuel of low sulfur content.

In both models, the modulating burner burns directly in the air stream ahead of a water spray chamber, which cools the air and humidifies it. If the recirculating water pump is turned off, the hot dry air can be used to preheat related equipment or even to dry cotton.

The standard control used with the Humidaire Unit throttles the burner and water spray pressure to maintain a constant air temperature and relative humidity.

A standard feature on both models is a device which continuously tests the recirculated water and replaces it when the amount of dissolved minerals becomes excessive. This helps prevent the formation of scale. The same device prevents the buildup of acid where a sulfurous fuel is used in the HU-60-1105.

LINT SLIDE GRID

The most popular application device is the Lint Slide Grid Assembly. 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.

Usually, the lint slide is covered with a hood to collect the used humid air and lint fly and return it to the lint flue riser 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.

LINT FLUE SCANNER 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 passing thru the lint flue to the battery condenser. This is accomplished by infrared scanning.

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 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 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. Its heat output is sufficient for this purpose. The standard control 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.

INSTALLATION NOTES

HU-60-1105 HUMIDAIRE UNIT

IMPORTANT NOTE ON FUEL

This unit was not designed to burn diesel fuel. DO NOT USE DIESEL FUEL. USE KEROSENE, NAPHTHA OR AVIATION JET FUEL of low sulfur content. Although its cost per liter may be higher, (it is sometimes lower!) the cost of operation per hour will be lower because you are using all the heat. To put fuel cost in its proper perspective, the value of the moisture added to the cotton at the lint slide is usually about 20 times the cost of the fuel used. The most important consideration is for the Humidaire Unit to produce enough high-humidity air to do its job.

If one is using diesel-fired drying burners, it may not be necessary to install a separate fuel tank for the Humidaire Unit. Some gins simply use kerosene or naphtha in their drying burners. Using the cleaner-burning fuel for drying results in less cotton tinged gray by smoke.

Regardless of the fuel used, the conductivity control will minimize the build-up of either acids or minerals in the unit. Doing this and keeping the unit clean will be effort well spent. This system will operate only when the HU-60 is running and the water pump is on.

COMPRESSED AIR CONSUMPTION

The Humidaire Unit burner uses compressed air to atomize the fuel. Be sure your compressor is large enough to supply:

7½ cubic feet per minute at 60 pounds per square inch, or
215 liters per minute at 4 bars (kilograms/cm2)

INSTALLATION AT THE LINT SLIDE

Refer to Drawing 14-2355. The fan used to move the humid air may be an 18-inch (457 mm) diameter vaneaxial fan, as shown, with a 10 HP (7.5 KW) motor turning the fan at 1750 rpm. A regular centrifugal fan mounted on the floor can also be used. A number 25 fan turning 1200 rpm with a 10 HP (7.5 KW) motor is satisfactory.

It is important to install a slide valve to regulate the air flow through the Humidaire Unit. Up to a certain point, you can increase moisture added to the cotton by reducing the air flow. Normal air flow is from 1000 to 2000 cubic feet/minute (1800 to 3600 cubic meters/hour).

Although it is not necessary, the lint slide may be covered and a hood installed as shown to collect the used humid air and fragments of lint blown up out of the slide. This can be piped into the lint flue at a point at least 10 feet (3 meters) from the condenser screen.

If you encounter problems in installing your Humidaire Unit, we invite you to telephone us at 806-795-5218.

INSTALLATION

HOISTING

If necessary to hoist the Humidaire unit, or to lift it with a fork lift, leave it bolted to the plywood bottom of its shipping box for stability. Unbolt it when it is in place.

LOCATION

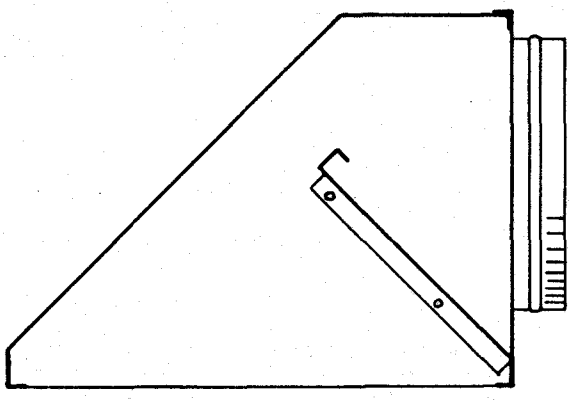
If the location of the Humidaire unit has not been specified on gin plans, it should be located in a clean place fairly close to the point of application of humid air. If the pipes are insulated (lagged), the humid air pipe can be run 80 to 100 feet (25 to 30m) without difficulty.

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, ask us for construction details of a suitable platform.

Refer to Drawing 14-2252 for space and other requirements. Be sure to leave 800 mm clearance to remove mist eliminator from spray chamber.

HOOD ASSEMBLY

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



WATER SCREEN

The water screen is shipped in the spray chamber. It goes in the bottom of the water tank, at the extreme left covering the pump intake pipe. Notice the notches in the screen frame which correspond to the tank openings. Extra screens may be ordered.

AIR PIPES

Connect air pipes in accordance with installation drawings. 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.

FUEL OIL

Kerosene (gas-oil), or aviation jet fuel of low sulfur content may be used. Connect the fuel oil supply to the fuel shut-off valve with tubing about 10 to 12 mm (3/8-inch) diameter. If it a necessity to have a fuel return line of the same size as above. It should be connected to the fuel system relief valve. There should be no valve in the return line as this could damage the fuel pump.

COMPRESSED AIR

A supply of compressed air at a pressure of about 5 to 10 bars (75 to 150 psi) is necessary to atomize the fuel. Connect the air supply line to the compressed air shut-off valve.

ELECTRICAL

For making electrical connections, appropriate instructions are attached which you can give to your electrician.

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.

WATER DRAINAGE FACILITY

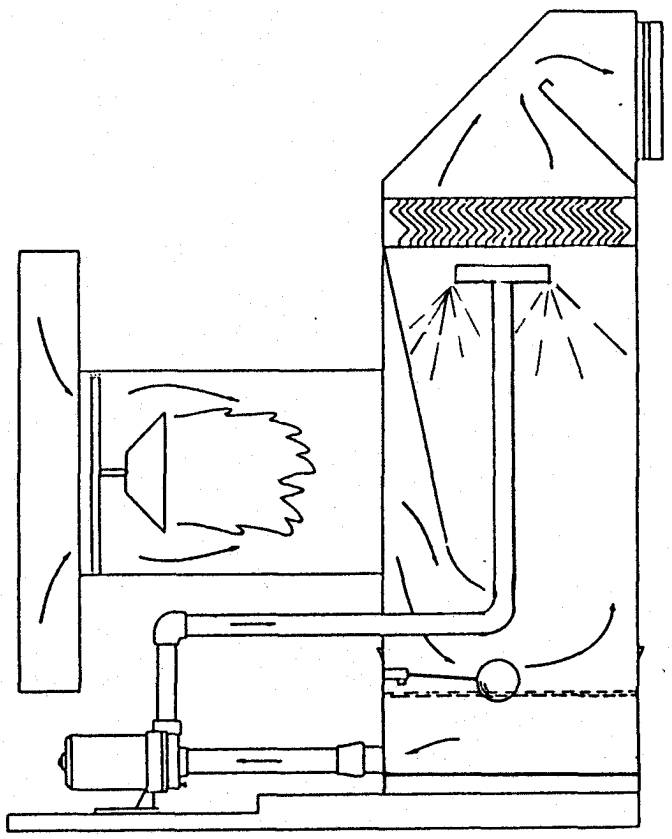
Connect the 2-inch water drain fitting to a sewer or soakage pit to receive the water periodically released by the cleaning of the unit as well as water periodically released by the water conductivity control. The purpose of the water conductivity control is to reduce maintenance by getting rid of the minerals in the water. All minerals are left behind in the machine. The conductivity control provides the only way to get rid of them. A water softener only exchanges sodium ions for harder ions. So, a conductivity control system is still necessary to avoid scale.

OPERATION

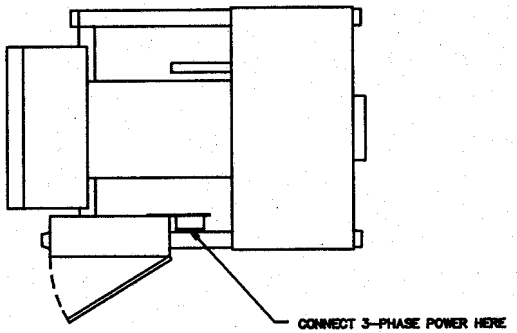
HU-60 HUMIDAIRE UNIT

THEORY OF OPERATION

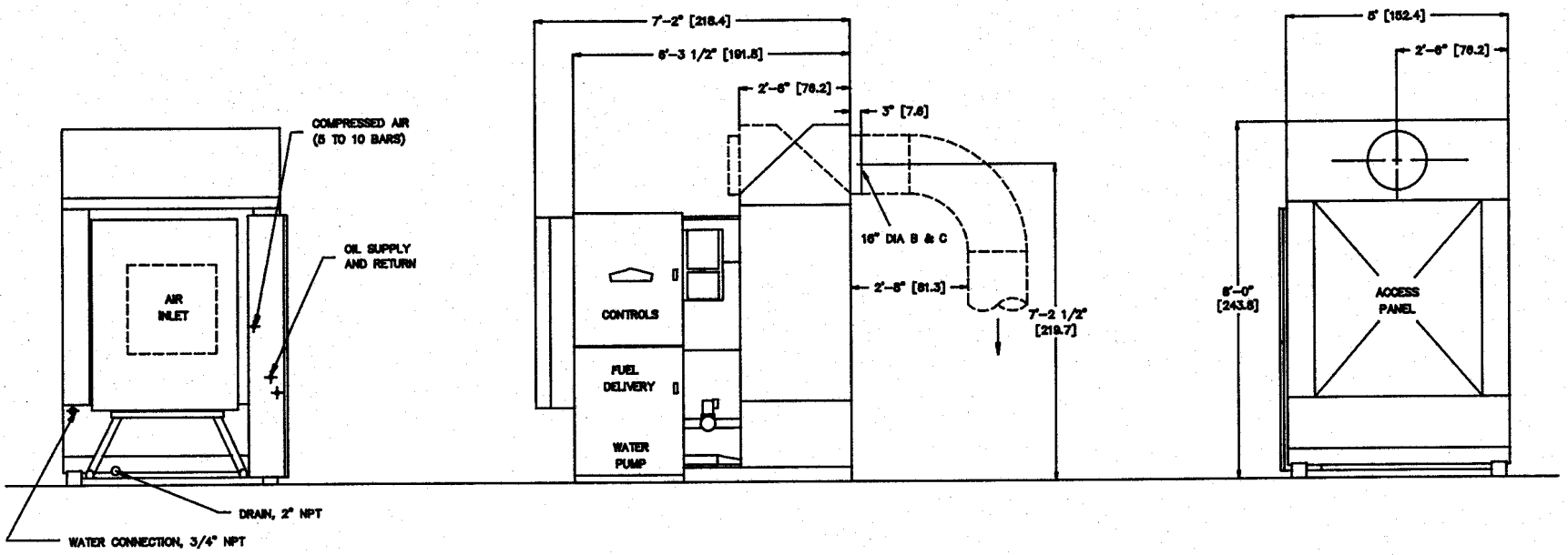
This unit produces warm, humid air for moistening cotton by drawing the air through a water spray chamber. Since heat is necessary to vaporize the water, the heat is introduced by burning oil in the incoming air stream and allowing the air flow to pull the hot air into the water spray chamber. The hot 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 discharged. 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



PLAN VIEW



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

DIMENSIONS IN FT'- IN" [CENTIMETERS]

ALSO FILED AS 14-2388

SAMUEL JACKSON MFG. CO.		
DIMENSION SHEET FOR HU-60-1105B OIL-FIRED HUMIDAIRE UNIT	1-90	2212

ADJUSTMENT AND MAINTENANCE

ADJUSTMENT

(These adjustments will be made at the factory, but are included for the convenience of those who wish to readjust the unit in the field.)

ELECTRICAL

1. Check voltage. Should be from 380 to 415 volts across terminals 1-2, 2-3, and 1-3 in the disconnect switch located on the side of the unit.

2. Check to see if voltage of secondary of the control transformer is 100 to 125 volts. (Check this on the electrical panel terminal 0 to terminal 10.) Note whether this voltage falls excessively when large motors in the gin plant are started. If so, it will be necessary to correct this electric supply problem or start the Humidaire Unit after all the other machinery is started.

3. In checking controls, all voltage measurements are made with respect to Terminal 10, which is grounded. (See trouble shoot guide in this manual.)

4. Check the local control panel lights. With air fan on, and air flowing thru unit, all lights should be on, down to and including ready light. If one light fails to lite, check the appropriate terminals and components to determine the problem. If air flow light is off, adjust the air flow switch until the light comes on.

5. Turn on the water pump by pushing in on the pump "jog" button, located on the local control panel. Check rotation direction of water pump, observing motor shaft. If wrong, interchange any two 3-phase wires in the disconnect switch box. Recheck direction.

6. Turn and hold burner switch to the right. Check rotation of the combustion air fan and fuel pump while holding the switch. Both of these motors should now be correct as all three motors (water pump, fan and fuel pump) are wired for correct rotation before shipment. If wrong, interchange any two wires located on the bottom of the motor starters.

7. Check the remote control to see if the combustion air fan and fuel pump will run when the burner switch is held to the right. If not, check to see the fan safety relay in remote control station has been connected to the indicator light of the humid air fan and the relay has pulled in. This relay insures that the burner goes off instantly when fan stops.

8. Using "hook-on" ammeter, check current in all leads of all motors. Compare current values to motor nameplate values. Current in all leads of each 3-phase motor must be substantially equal. If not, check supply voltage and motor connections.

9. See that high temperature limit switch is adjusted to 225°F.

COMPRESSED AIR

10. See that compressed air supply of about 5 to 10 bars pressure (75 to 150 psi) is connected to the compressed air shut-off valve and that the valve is open.

11. On atomizing air pressure switch, set pointer to 25 psi.

12. Temporarily jumper Terminal 13 to Terminal 1 to open atomizing air solenoid valve.

13. Adjust regulator until air pressure gage on burner reads 50 psi.

KEROSENE (GAS-OIL)

14. See that fuel oil supply is connected to fuel shut-off valve, and fuel return is connected to the fuel system relief valve, with tubing about 10 to 12 mm diameter. There should be no valve in the return line as this could damage the fuel pump.

15. With temporary jumper of Step 12 in place to open fuel solenoid valve, install another temporary jumper from Terminal 1 to 3M fuel pump motor starter Terminal A1. Observe oil pressure gage. It should read 50 psi. If not, it may be necessary to purge air from supply line. To do this, disconnect oil hose from burner until oil runs clear of entrained air while running fuel pump. Pressure should be about 20 psi with hose disconnected. Remove jumper from Terminal 1 to Terminal 13 (Step 12).

16. Connect hose to burner, run pump, adjust pressure relief valve until pump pressure reads 50 psi. Remove jumper from Terminal 1 to fuel pump starter.

WATER SUPPLY

17. See that water supply line is connected to tee under hose cock. Shut-off valve must be open.

18. Adjust float valve (located in water tank) until water level is about 10 to 15 mm below overflow opening. Float rod may be bent upward only to adjust level. Check to see that water screen is in proper position.

MODULATING MOTORS

19. On the oil burner actuator motor, remove back cover, check to see that low limit switch is made when motor reaches near the end of its low travel. If not, adjust switch through slot in upper part of motor.

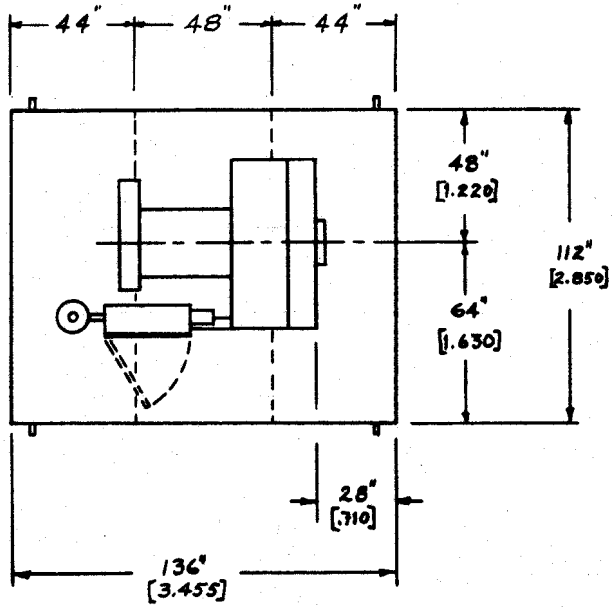
20. Care must be taken if the linkage from the oil burner to the motor is to be adjusted. Leave about 1/8 of an inch between the sector cap screw at high fire and low fire stop cap screw.

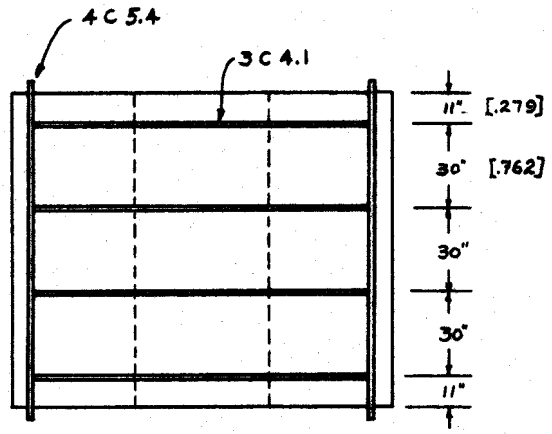
21. Check water valve actuator to see that it will move to the full open position. If not, adjust linkage. Check to see that water valve will close fully after linkage adjustment.

BURNER OIL FLOW ADJUSTMENT

22. Remove linkage connecting oil valve actuator to the burner sector arm. Remove nameplate from sector arm of Micro-ratio valve. This exposes a series of adjustment screws which increases the flow of fuel oil when turned clockwise.

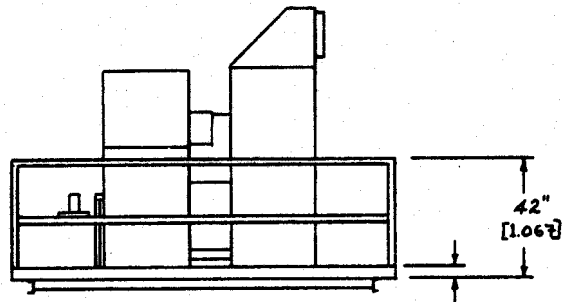
23. Rotate the sector arm through its travel by hand. At each numbered position, adjust the screw which is aligned with the lug on the bottom of the valve until flame is neither smoky (too much fuel) nor odorous (too lean).





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
HUMIDAIRE UNIT

DWN. BY	SGJ	DRAWING NO.
DATE	4-28-78	14-2290

OPERATION

HU-60-1105B

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 an oil-fired burner, burning in the incoming air stream of the Humidaire unit. As the air passes upward through zig zag baffles at the top of the water spray chamber, the water drops impinge on the baffles and are pulled back into the spray chamber by gravity allowing only humid air to pass upward into the air discharge hood. The fan draws the air from an opening in the hood and blows it to the appropriate places in the gin plant where humidification is desired.

The oil-fired burner has a modulating motor which turns it up and down. The controls are programmed so that the modulating motor must turn the burner down before it will attempt to ignite. The modulating motor will not turn the burner up unless ignition has taken place, as indicated by the protectorelay turning on the "Flame" indicator light at both the local and remote control stations.

CONTROLS

The burner of this Humidaire unit can be started from the remote or local station. A local control and information station is located in the upper cabinet on the electrical panel.

A remote automatic control is provided with each Humidaire unit. It can be located for operation from the console of the ginning plant. The 14900 Lint Flue Scanner control, when used with the Humidaire unit, will turn the water pump on or off in response to the presence of cotton in the battery condenser lint flue. It is usually used with the lint slide grid application.

To operate the unit from the local station, the fan should be moving air through the unit, the burner can now be ignited by turning the start knob and holding it to the right. When this is done, the protectorelay is energized which will apply power to the igniter plug, as indicated by the "spark" indicator light. If flame is not established within about 15 seconds, the protectorelay will time out and must be reset by pushing its purple push button. Normally, the establishment of flame will be indicated by the "Flame" indicator light. When this light is "on", turn loose of the spring loaded start knob. To shut the burner down, turn the start knob to left.

The water pump may be checked by pushing the pump "jog" button, located on the local panel. The water pressure gauge should read about 27 psi on 50 HZ power and about 32 psi on 60 HZ power. If pressure is considerably different from this, see maintenance instructions in this manual.

NORMAL OPERATING PROCEDURE

The Humidaire unit should be one of the first machines started when the gin plant is placed in operation. It should be allowed to run with only its burner on while all the other machinery is started up. It will thus heat up its fan and piping and the machines in which it is applied so that when the water pump is turned on and humidification begins, there will be no problem with moisture condensing on cold metal surfaces. In lint slide grid installations, the water pump switch can be left on and the water pump will be turned on automatically by the 14900 Lint Flue Scanner.

To find the proper control setting for best operation, some experimentation will be necessary. In most applications, the general rule to be followed is to run it at as high a setting as possible without causing chokeups. Remember that preheating the system solves most problems involving condensation. No special procedure is recommended in turning off the unit.

TROUBLESHOOTING THE HU-60-1105B

USING THE 16030 SEQUENCE PANEL

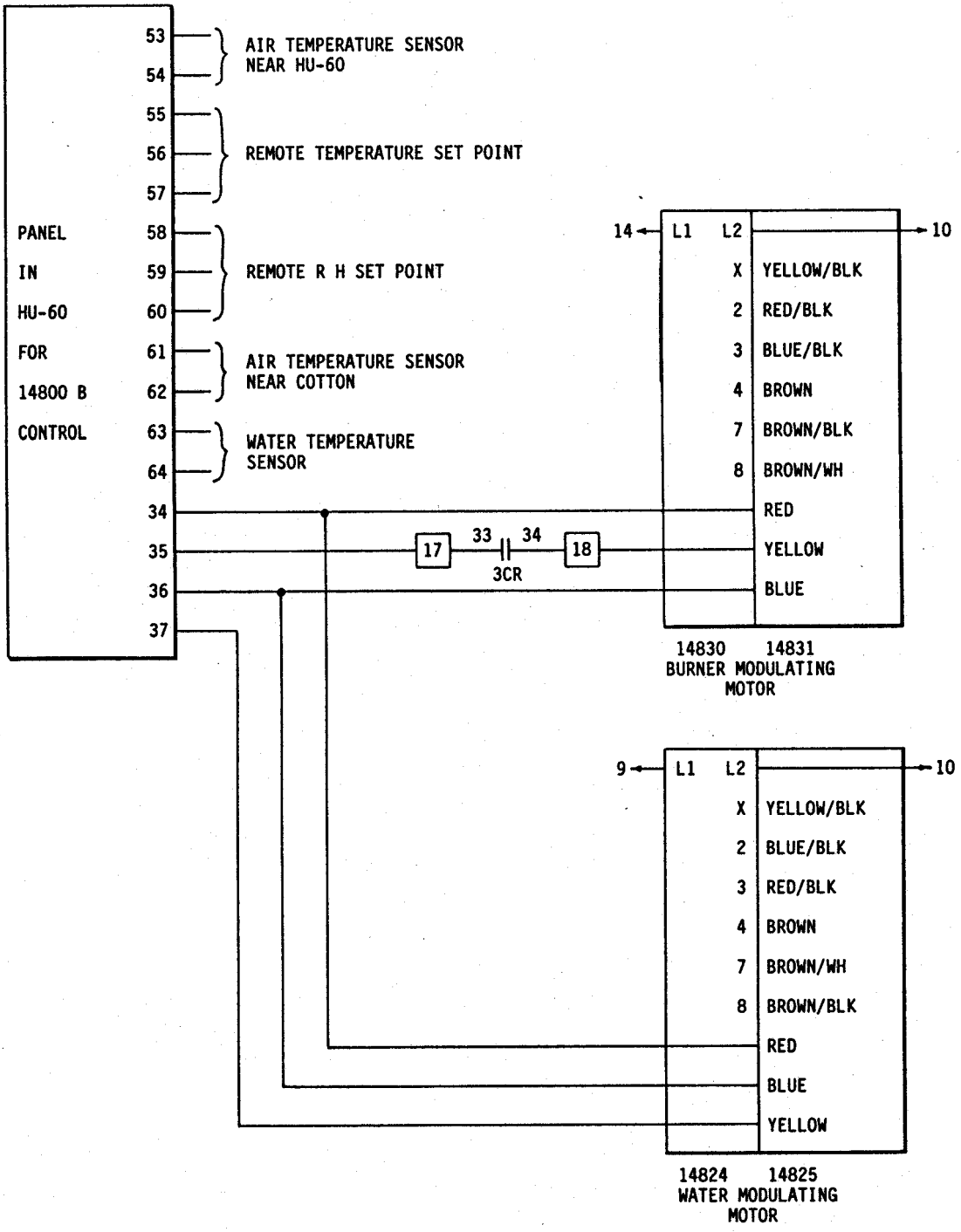
LIGHT CONDITION	POSSIBLE PROBLEMS AND REMEDIES
None lit	Circuit breaker on sequence panel tripped. Push to reset. Large switch at side of cabinet open. Power not being supplied to Humidaire Unit. If 3-phase power is present, but 120-volt control power is not, check transformer in box below large switch at side of cabinet.
1 on, 2 off	Low air flow through HU-60. Increase air flow or adjust air flow switch. Check for water in plastic tube to air flow switch.
2 on, 3 off	High Temperature limit switch open. Clean the air inlet screen.
3 on, 4 off	No compressed air supply.
4 on, 6A off	Humid air fan relay not operating. Check fan operation and wiring at remote control.
4 on, 7 off	Same as above. Water pump switch turned off.
6A on, 8A off	(When holding burner selector switch in start position.) Safety switch in Protectorelay has timed out. Press purple reset button.
8A on, 8 off	Burner will not light. Check fuel pressure. Check fuel supply and valves in fuel line. Clean spark plug tip. Check for carbon on lens of flame scanner. See Problem 3 for more remedies.
7 on, 7A off	Cotton not flowing. Cotton flow switch not operating.
7A on, 9 off	Time delay relay 1TD still open. Burner must be on one minute for water pump to operate.

TROUBLESHOOTING THE HU-60-1105B

LIST OF PROBLEMS

PROBLEM	POSSIBLE CAUSES AND REMEDIES
1. Humidaire 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. Make sure tube is not clogged. Electric power supply off. 5 AMP circuit breaker tripped. Press to reset. Check indicator lights inside control cabinet.
2. Burner will not light	See if problem one applies. Press reset button on protectorelay. Check fuel supply to pump. Check fuel pump, should run during starting. Burner modulating motor must throttle burner to low fire position before ignition can take place. Check spark plug, clean any fuel off end of plug. See if "L" relay in protectorelay pulls in. If not, check flame scanner. See Problem 3 below. Make sure combustion air fan operates, but starter 2M drops out while "spark" light is on. Press reset button on starter 2M and 3M.
3. Burner goes off	Air flow switch may need adjustment. Turn screw in center of mounting post CCW. Low voltage may affect protectorelay. Flame scanner may be bad. Replace it. Clean lens of flame scanner. Scanner can be damaged by spikes in voltage supply Order 16048 surge suppressor if not included on your unit. High temperature can also damage scanner. If it is connected to burner with steel pipe nipple, order 15092 CPVC nipple.
4. Burner lights, but will not modulate.	Low fuel pressure due to filter stopped up. Check and clean filters. Check for closed valves in fuel line. If using diesel oil instead of the recommended kerosene, it may gel in cold weather. Add special antifreeze or dilute with kerosene, about 25%. Low fuel pressure due to fuel pressure relief valve. Set pressure to 50 psi. Defective burner modulating motor. Defective temperature sensor. Burner turned down low at remote control.

PROBLEM	POSSIBLE CAUSES AND REMEDIES
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. Check to see that water pump motor turns freely. Press reset button on motor starter. Check that all three phases of power are present. One fuse might be blown in distribution panel.
6. Water in humid air coming from unit-- As condensation	System should be preheated before water pump is turned on. 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.
7. Not enough humidification	Low water pressure, See Problem 9 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. See 14800B Control, p. 6-31 et seq.
8. Water pressure too high	If water pressure is higher than the normal maximum, this is an indication that water spray nozzles may be clogged. The nozzles may appear to be open, yet be clogged in their primary orifices. To check this, remove the spray chamber access panel, stand back, and have someone press the "Jog water Pump" button on the sequence panel in the control cabinet. Observe for full spray cone coming from each nozzle.
9. Water pressure too low.	Observe water modulating valve. Mark on end of valve shaft shows position of internal vane. If this is closed, consult section on 14800B control, page 6-31 et seq. Check for air leak on suction side of water pump. Water level in tank may be so low that water pump sucks air. Check float valve and water supply system. Water pump may be running backwards.



FOR ELECTRICAL SCHEMATIC FOR
HU-60-1105B, REFER TO DRAWING
14-2451A FOR SER. 4944-4945
14-2470 FOR SER. 4946-4953

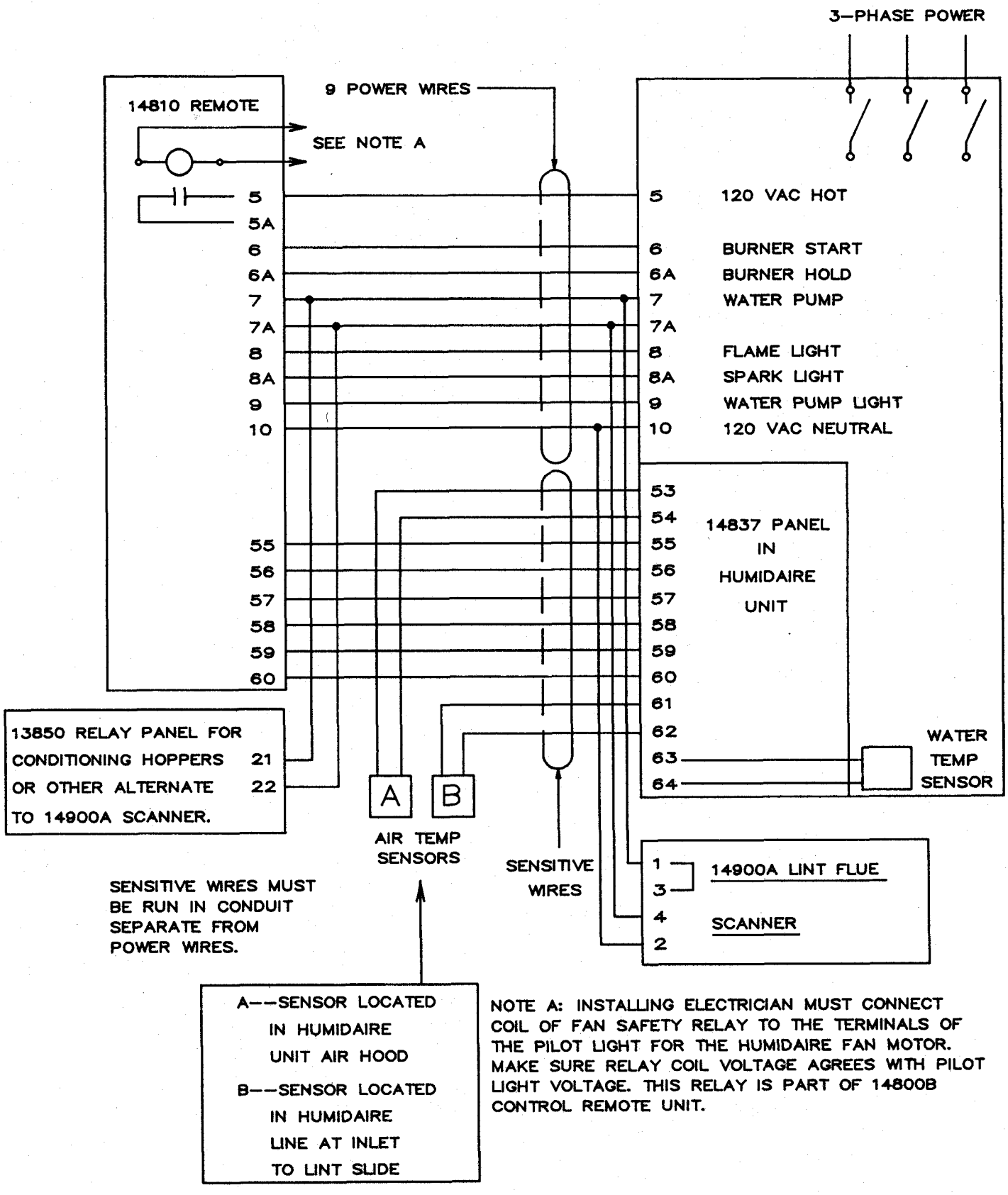
SAMUEL JACKSON MFG. CORP.

ELECTRICAL CONNECTIONS
14800 B CONTROL
USED WITH HU-60-1105B
SERIALS 4944 - 4953

DWN. BY SGJ
DATE 2-87
DRAWING NO. 14 - 2471

EXTERNAL ELECTRICAL CONNECTIONS
HU-60-1105B HUMIDAIRE UNIT WITH
14800B CONTROL

2222
10-88

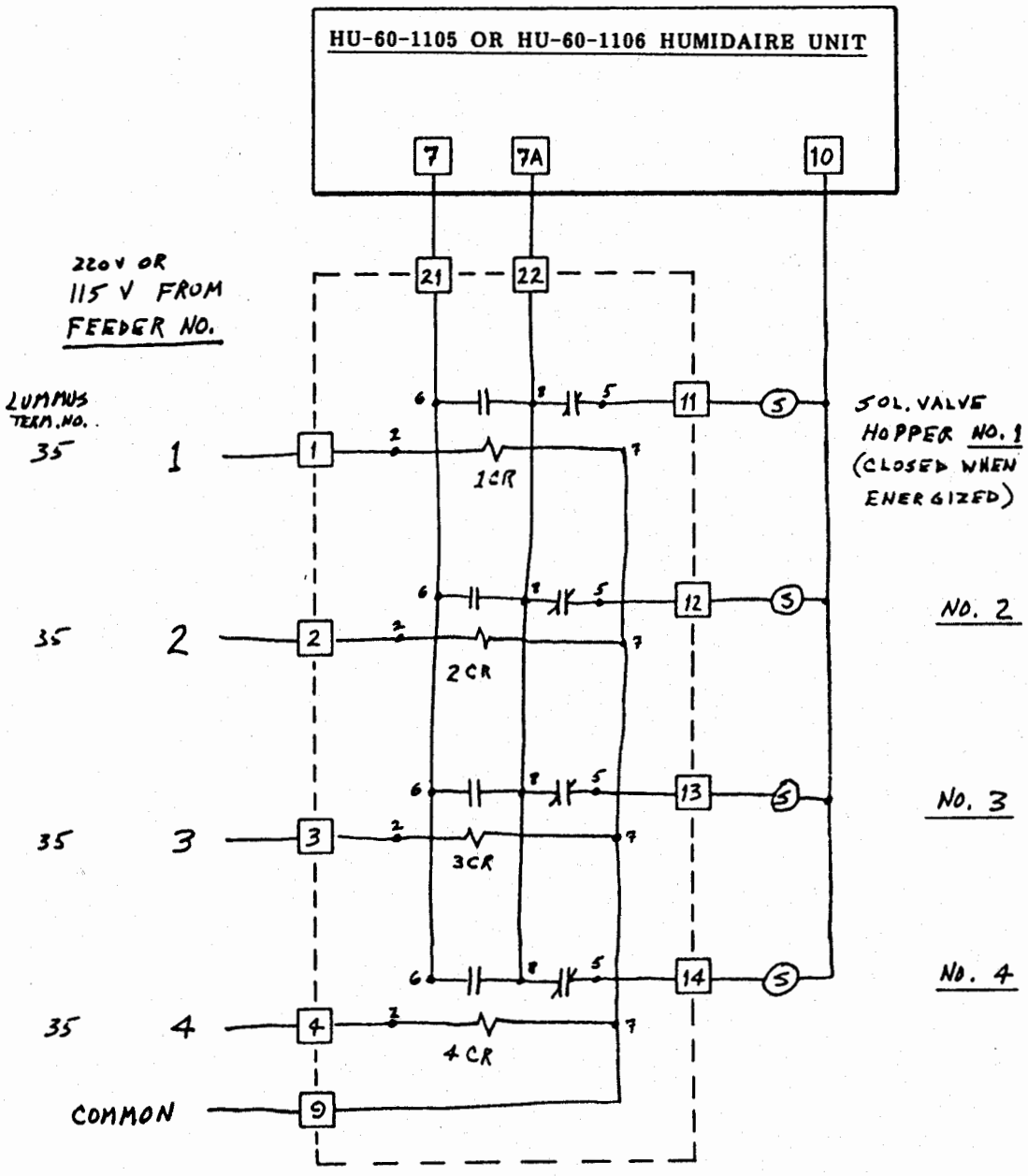


NOTE A: INSTALLING ELECTRICIAN MUST CONNECT COIL OF FAN SAFETY RELAY TO THE TERMINALS OF THE PILOT LIGHT FOR THE HUMIDAIRE FAN MOTOR. MAKE SURE RELAY COIL VOLTAGE AGREES WITH PILOT LIGHT VOLTAGE. THIS RELAY IS PART OF 14800B CONTROL REMOTE UNIT.

ELECTRICAL SCHEMATIC

13850 RELAY PANEL

FOR JACKSON CONDITIONING HOPPERS



REF: LUMMUS EC-79 1253 B

4 NO. 13146 RELAYS, KRP 11A 120 VAC.
USE 220 V RELAYS FOR LUMMUS EXPORT.
SOLENOID VALVE COILS ARE ALWAYS
120 VAC. THEIR POWER COMES FROM
TERMINAL 7 OF HUMIDAIRE UNIT.

5-85

14-2330B

14800 AUTOMATIC CONTROL FOR THE HUMIDAIRE UNIT

NOTES FOR THE INSTALLING ELECTRICIAN

In some instances, this control will be installed in a 13950 Box, furnished with it. This box is usually located at or near the gin's motor control console, but the gin manager may specify another location, perhaps near the press. If the 14800 Control is to be mounted in the console, it requires a CUTOUT 9-1/8" wide by 5-1/8" high (232 x 130 mm). On the face of the console, it occupies a space 10" wide by 6" high, and requires 10" clearance behind the panel (254 x 153 x 254 mm).

Note that each 14800 Control shipped with an HU-60 Humidaire Unit is factory calibrated for that HU-60 and marked with its serial number accordingly. Please match the control unit with its respective HU-60 if multiple installations are being made.

The 14800 Control includes a fan relay which kills the Humidaire Unit burner the instant the fan stop button is touched. This refers to the humid air fan on a lint slide installation or the push fan on a tower dryer installation. It is important that you connect the fan relay coil to the terminals of the fan pilot light. Make sure that the relay coil voltage is the same as the pilot light voltage.

INSTALLING SENSORS

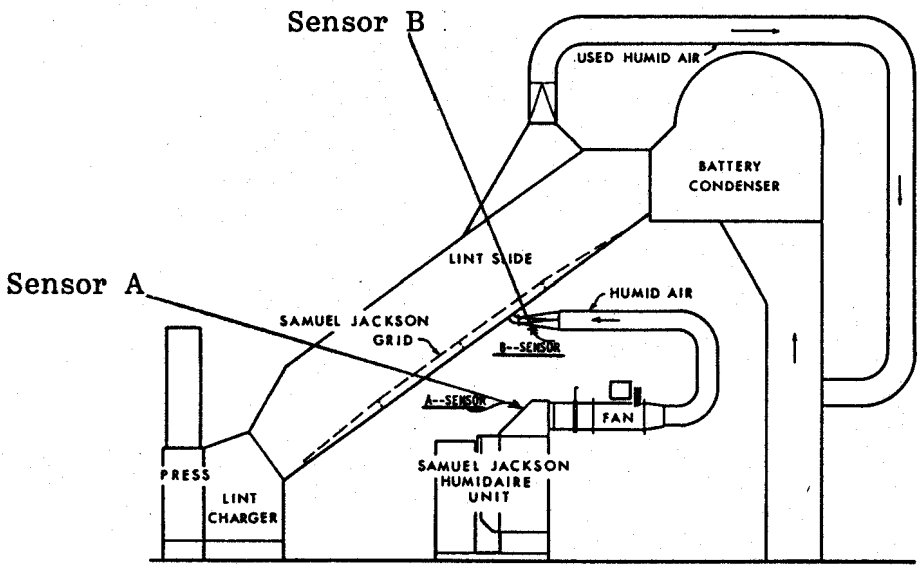
The sensors are not thermocouples, but resistance temperature detectors; therefore, they do not require thermocouple wire. They are sensitive, however, and their wires should be shielded or run in separate conduit. When shielding them, as well as the other sensitive wires shown on the wiring diagram, make sure that the shield is grounded on only one end. No. 16 copper wire is satisfactory for all connecting wires. One sensor is to be installed in the air hood of the humidaire unit, the other one near the inlet to the lint slide grid.

See following drawings for proper location of sensors.

LOCATION OF AIR TEMPERATURE SENSORS

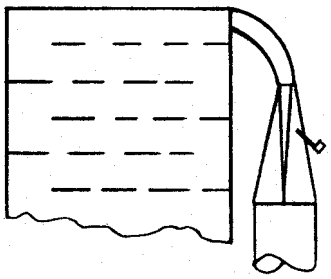
14800 CONTROL

LINT SLIDE AND CONDITIONING HOPPER INSTALLATIONS:

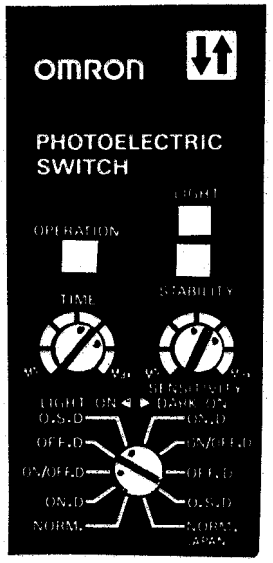


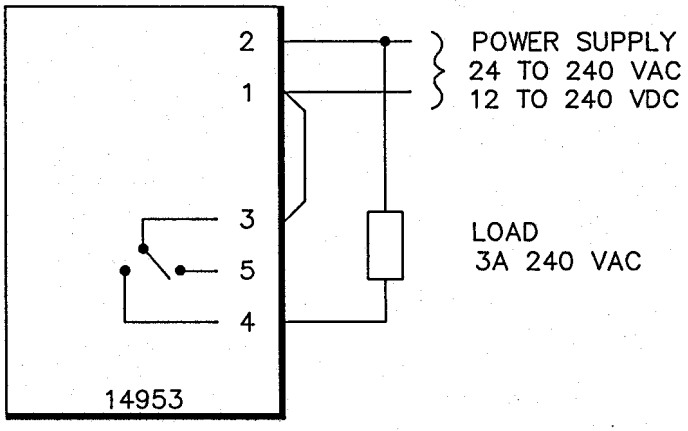
TOWER DRYER INSTALLATIONS:

When used at the tower dryer, the two (A & B) air temperature sensors should be located in the incoming cotton line of the tower. Do NOT mount them in the tower. This location is unusual. but it is IMPORTANT and NECESSARY for proper operation of the control. Use 13740A sensor mounts.



LINT FLUE SCANNER
SETTING AND WIRING





The diagram above shows the normal setting and wiring of the 14953 Photoelectric Switch, which is part of the 14900A Lint Flue Scanner.

The lower selector determines the operating mode for the scanner. The setting for the lint flue is LIGHT ON and OFF DELAY.

The SENSITIVITY adjustment is at right. Moving the pointer from MIN toward MAX will make the scanner respond to less cotton or cotton which is farther away. If the red "LIGHT" LED will not come on when cotton is present, increase the setting. If it will not go off when cotton is not present, decrease the setting. The green LED shows the stability of the detection.

The TIME adjustment is for the time delay which keeps the load relay ON when no cotton is in the scan range. This is shown by the yellow "OPERATION" LED. This delay keeps the water pump or solenoid valve from cycling ON and OFF. Adjust it to "Max."

The maximum load for the relay contacts in the scanner is 3 amperes at 240 volts AC. The circuits of Humidaire Units and Lint Slide Sprayers are within this limit. If used for other applications with a load greater than this, interpose a contactor or relay between the scanner and the load. The voltage of the power supply for the load can be different from that supplied to the scanner on terminals 1 and 2.

14900A

LINT FLUE SCANNER
INSTALLATION INSTRUCTIONS

APPLICATION: The 14900A control is used to determine when cotton is passing through a lint flue. It is used with the Samuel Jackson Humidaire Unit to operate its water pump only when cotton is being ginned. It can also be used with the Lint Slide Spray Unit.

The 14900A control has a special mount which allows the 14953 photoelectric infrared scanner to look through a tiny window at the oncoming flow of air and lint. When cotton is detected, the control closes its circuit, and turns the water pump on. A built-in time delay keeps the circuit closed even though the presence of lint is interrupted for a few seconds.

MOUNTING THE CONTROL: The 14900A Lint Flue Scanner should be mounted in a flat area of the lint flue, usually in the riser to the battery condenser. Avoid locations where elbows and offsets might divert lint away from the control. The 14775 mount fits into a 3 x 4 inch (75 x 100mm) rectangular hole in the wall of the flue. The stream of air and lint should blow against the small window.

ELECTRICAL WIRING: Be sure to follow the wiring drawing supplied with the Humidaire Unit or Lint Slide Sprayer. The 3 wires going to the 14900A control MUST be in a separate conduit from any power wires.

ADJUSTMENT: The 14900A Lint Flue Scanner has been adjusted at the factory, but may require further adjustment. If further adjustment is necessary:

1. Insure that 14900A has been wired into the system correctly. Apply power.

2. With the 14900A installed correctly in the lint flue and with cotton coming through the lint flue, the red "LIGHT" LED should be on. The yellow "operation" LED should be on and remain on until cotton is no longer present and the time delay has timed out. If the "LIGHT" LED fails to turn on with cotton in the system, turn the sensitivity adjustment clockwise until "LIGHT" comes on. This adjustment is located on top of the 14900A.

3. When no cotton is present in the lint flue, the "LIGHT" LED should be off. If the "LIGHT" LED fails to turn off, adjust sensitivity counterclockwise until it goes off.

4. Set the sensitivity pot midway between the two operating points determined in steps 3 and 4 for optimum operation. Make sure the green "STABILITY" light illuminates in both detecting and non-detecting states.

5. The off time delay is set to maximum (12 seconds) and should not need further adjustment. This prevents cycling the water pump.

TROUBLESHOOTING: If the control does not operate properly, follow the steps below. An AC voltmeter is the only test equipment needed.

1. Remove the scanner from its mount. Look through the window and see if cotton can be seen going past the window. If not, the scanner and mount must be moved to a better location.

2. Make certain that window glass and lenses of the control are clean and dry. An accumulation of dust or lint on the window glass next to the control can affect its operation.

3. Check power to 14900A, by removing switch from mount, then remove top cover. Connect voltmeter across terminals 1 and 2. With the Humidaire Unit on and running, there should be 95 to 130 volts present. (For the Lint Slide Spray Unit this should be about 24 volts.) With the scanner seeing cotton, the same voltage should appear across terminals 4 and 2. If no voltage can be found, then trouble lies elsewhere in the circuit, not in this control.

4. If control does not respond to cotton properly, see Adjustment steps 2 to 4 above.

5. If, when the switch is tested, the yellow "OPERATION" LED comes on but the water pump stays off, check the pump wiring and overload.

If the unit is still inoperable, contact: SAMUEL JACKSON MFG. CO. Telephone 806-795-5218, Lubbock, Texas.

14-2448B 2-90

WATER CONDUCTIVITY CONTROL SYSTEM

The Conductivity Control System measures the electrical conductivity of the recirculated water. This conductivity is a measure of the quantity of dissolved minerals, which will cause scale in the Humidaire Unit if not purged. On kerosene-fired Humidaire Units, sulphur in the fuel can cause the water to become acid and more conductive. In this case, the conductivity control prevents corrosion of the metal parts. The dial of the controller is numbered in micromhos (reciprocal megohms).

The Conductivity Control system comprises:

14530	Conductivity Controller. This is the instrument mounted in the electrical control cabinet.
14532	Sensor, installed in the intake pipe before the water pump. The mark on the electrode must be aligned with the mark on top of its fitting.
14783	Solenoid water valve which purges contaminated water from the Humidaire Unit. This is used on Humidaire Units with serial numbers higher than 4855. It is connected to the NO and N contacts of 14530. It replaces the following two items.
*14465	Solenoid air valve, which controls the compressed air which closes the
*14680	Air-operated water purge valve. (Part No. 14427 on Humidaire units with serial numbers below 4826.) This valve, when opened, bleeds contaminated water from the Humidaire Unit.
14700	Descaler Injector Kit (Optional). When available, this device will inject a small quantity of liquid descaler into the water tank each time water is purged.

OPERATION When the water conductivity reaches the value set on the 14530 Controller, it opens the water purge valve, allowing contaminated water to be pumped out. Clean water comes in through the float valve, lowers the conductivity to a satisfactory level and the controller closes the purge valve until another purge cycle is required.

INSTRUMENT SETTINGS

"ON/OFF" SWITCH. This turns controller on and off. No purge will occur in OFF position.

"CAL TEST/OPER" SWITCH. This switch is used to test the instrument independently of the sensor. Position the switches to ON and CAL TEST. The red "control" light should go on and remain on until the dial is turned to 6000 or close to it. Instrument calibration can be adjusted, if necessary, by means of a potentiometer on the printed circuit board inside the control. Return switches to ON and OPER for normal operation and for setting the control point.

SETTING CONTROL POINT. With fresh, clean water in the Humidaire Unit and the water pump operating, set to ON and OPER and allow instrument to warm up for about 3 minutes. Slowly turn the control pointer downscale until

*Obsolete. Superseded by 14783.

"control" light comes on. Note dial reading. This is the normal conductivity of your supply water. For operation, set the dial to a figure 400 to 1000 micromhos above the supply water conductivity. A smaller addition will bleed off more water and keep the water purer. A larger addition will bleed off less water, but increase the possibility of scale formation or acid corrosion. We recommend that you experiment to find the best setting.

If the optional descaler injector is used, a low setting will also inject descaler more often. If some scale does form during the operating season, remove it by applying Part No. 14000 Powdered Acid Descaler.

CLEANING: Periodically remove the 14532 sensor from the pipe and wipe its carbon buttons clean. If stubborn scale is present, a fine grain emery cloth may be used for cleaning. Take care not to disturb the temperature sensor, which is encased in a glass bead just below the surface level.

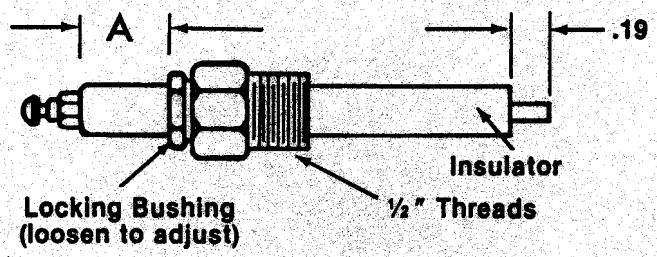
TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSES AND REMEDIES
Power light not on.	ON-OFF switch off.
	Water pump not running.
	Fuse blown. Replace with 10-amp fuse.
Fuse blows.	Short or ground in solenoid valve or wiring to it.
Control light stays on.	Switch in CAL TEST position. Move to OPER.
	Drain line plugged or water purge valve not operating.
	Control pointer set below conductivity of incoming water supply.
	Sensor leads or sensor may be shorted. Unplug to test.
Scale builds up in Humidaire unit or corrosion occurs in kerosene-fired unit.	ON-OFF switch off.
	Control pointer set too high above conductivity of supply water.
	Sensor fouled or dirty. Clean it per instructions or replace it.
	Drain line plugged or water purge valve not operating.
Special reminder:	Drain line must be installed and connected to Humidaire Unit for this device to work.

ADJUSTMENT OF

12796 AND 14200 SPARK IGNITORS

(MAXON 25663)



SJMC PART NO.	FOR SAMUEL JACKSON MACHINES	DIMENSION A MM	INCHES
12796	HU-60-1065 HO- 7-1114	25	1.00
14200	HU-60-1105 HO- 4-1112 HO- 4-1118	40	1.56

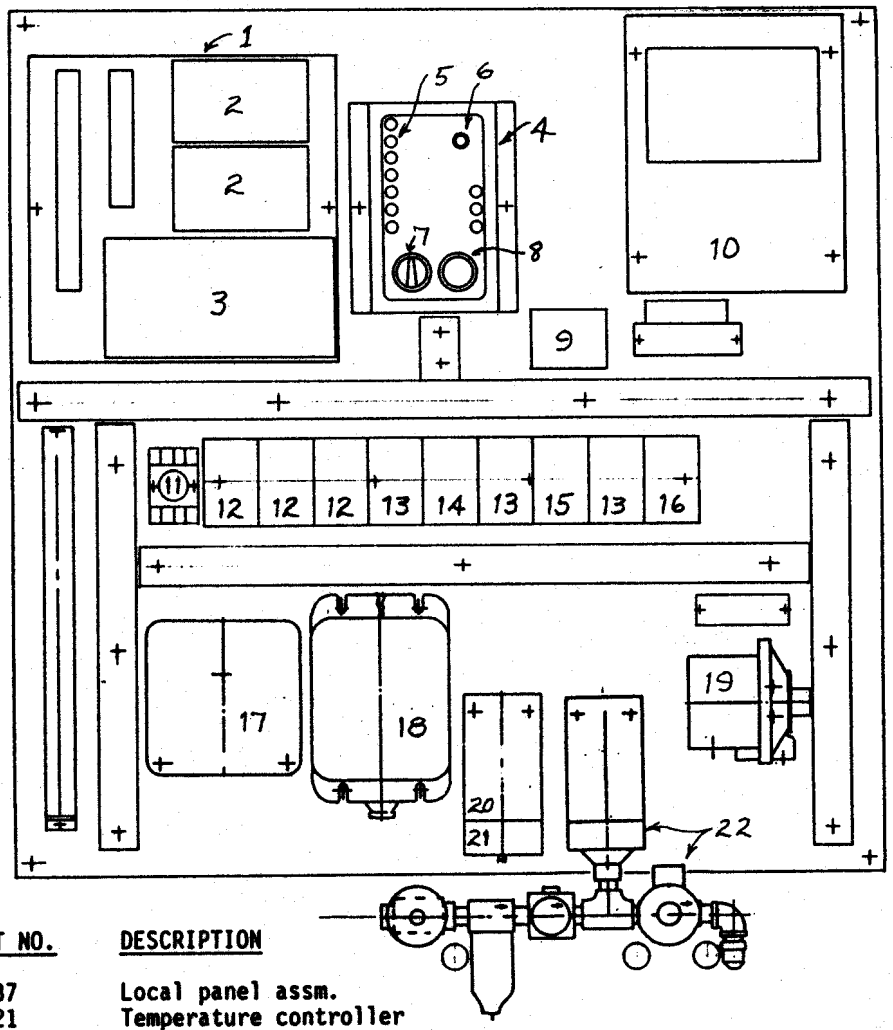
14280B
SPARE PARTS KIT FOR
HU-60-1105B KEROSENE-FIRED HUMIDAIRE UNIT

10-14280B

QUAN.	PART NO.	NAME
1	14971	Water Pump, W/4HP Motor
1	14974	Shaft seal for water pump
1	14869	Pump Body O-Ring
1	12792	Protectorelay RA890G
2	12794	Minipeeper ultraviolet scanner
1	9991	ASCO Y-strainer
2	9992	Strainer screens for 9991 Y-strainer
2	14200	Spark plug
1	11277B	Water pressure gage, 0-60 psi
1	14745	Water tank screen
1	12150D	Mist eliminator, S.S. Assm.
3	~~14361~~	Pilot Light, or ~~14362~~ Pilot Light 14839
1	14742	Float valve
1	11069	Float Valve Rod
1	11068A	Float Ball, S.S.
3	14829	Temperature Sensors with nut and Compression sleeve
1	~~16061~~	Relay, Time Delay 16023
1	15601	O-Ring, 2¼ ID
1	15602	O-Ring, 3/4 ID
3	15603	O-Ring, 1/2 ID
2	16558	O-Ring, 122 Viton

ELECTRICAL CONTROL PANEL

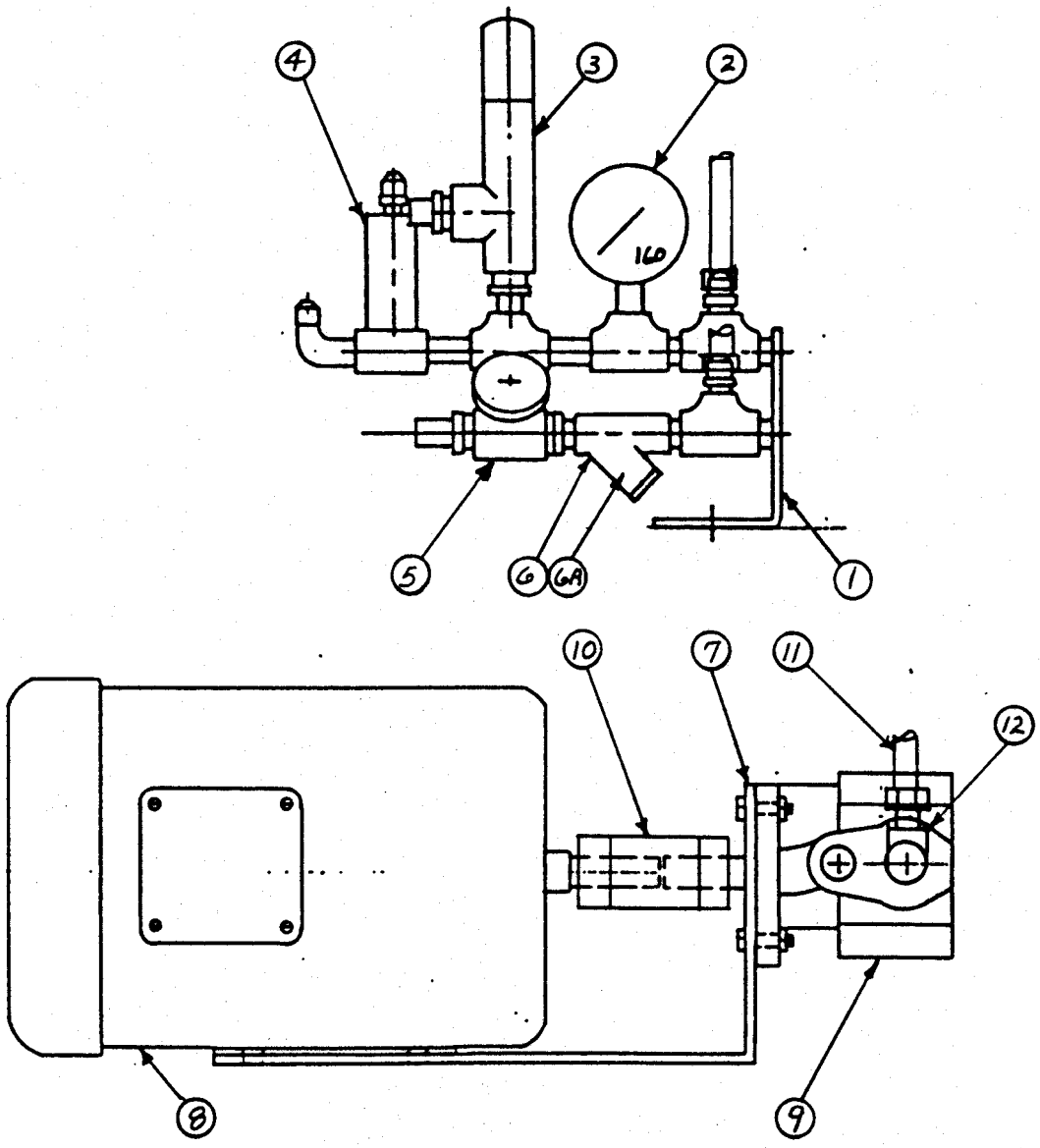
HU-60-1105B



REF. NO.	QUAN.	PART NO.	DESCRIPTION
1	1	14837	Local panel assm.
2	2	14821	Temperature controller
3	1	14823	Automatic reset module
4	1	16030	Sequence panel
5	10	14361	Pilot light, amber
-		or 14362	Pilot light, red
6	1	14741	5-amp circuit breaker
7	1	14495	Selector switch less contacts
8	1	14447	Push button less contacts
-	2	14448	Normally open contact
-	2	14449	Normally closed contact
9	1	16048	Surge suppressor
10	1	14530	Conductivity control
11	1	~~16061~~ 16023	Water pump time delay relay, 60 Sec.
12	3	14853	Relay, PH31E
13	3	14854	Contactor
14	1	14856	Water pump motor overload
15	1	14736	Combustion air fan motor overload
16	1	14737	Fuel pump motor overload
17	1	12792	Protectorelay, RA890G
18	1	11172	Ignition transformer
19	1	13750	Air flow switch, 1823-0
20	1	14392	Switch unit, high temperature
21	1	14393	High temperature transducer
22	1	14797	Atomizing air control assm.

(See separate page)

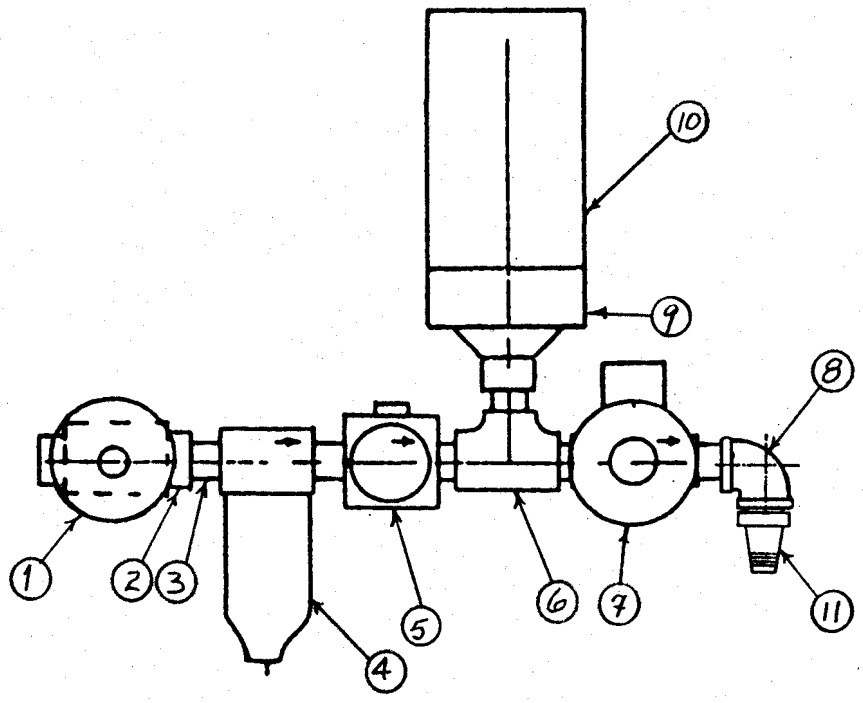
FUEL SUPPLY ASSEMBLY



REF.	QUAN.	PART NO.	DESCRIPTION
1	1	14415	Fuel pipe assembly
2	1	12313	Oil pressure gauge
3	1	12385	Fuel pressure relief valve
4	1	14456	Air operated shut-off valve
5	1	13625	Gate valve
6	1	9991	Fuel Strainer
6A	1	9981	Fuel Strainer screen
7	1	14956	Fuel pump and motor assembly
8	1	14735	Fuel pump motor, 3 Phase
9	1	14411	Fuel pump
10	1	9838	Pump shaft coupling
11	2	14799	Fuel pump hose
12	2	15038	Fuel pump hose connectors

14797

ATOMIZING AIR CONTROL ASSM.



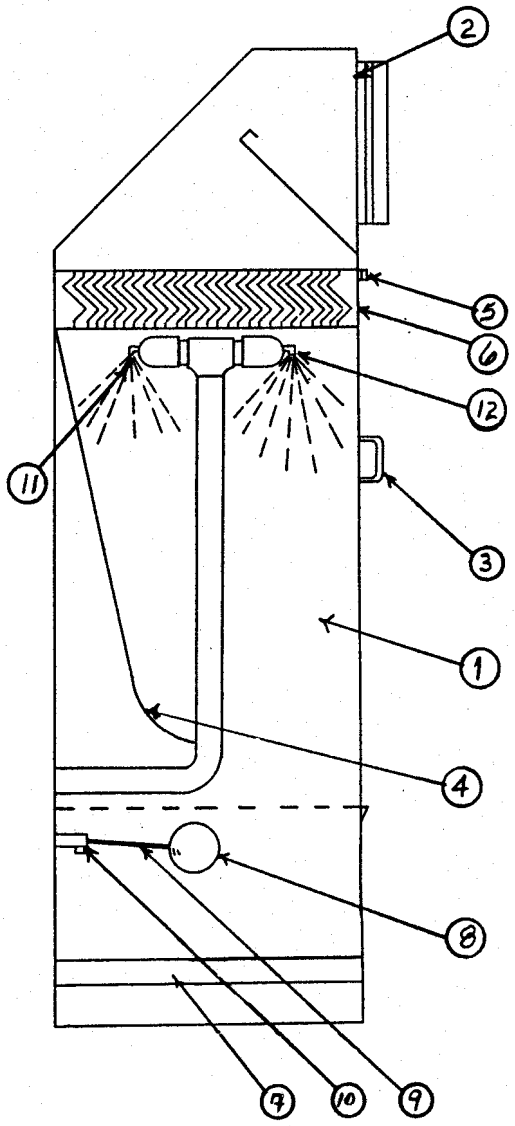
REF.	QUAN.	PART NO.	DESCRIPTION
1	1	13625	Gate Valve
2	1	15069	3/8 x 1/4 Bushing
3	6	15041	1/4 x clo nipple, galv.
4	1	13593	Air Filter
5	1	13594	Air Pressure Regulator
6	1	15040	1/4 x 1/4 x 1/4 Tee, galv.
7	1	13598	Atomizing Air Valve
8	1	15031	1/4, 90° elbow, galv.
9	1	14391	Pressure Transducer
10	1	14392	Switch Unit
11	1	13367	½ Union ¼ MPT x 3/8 Flare

1105B

13460A

WATER SPRAY CHAMBER

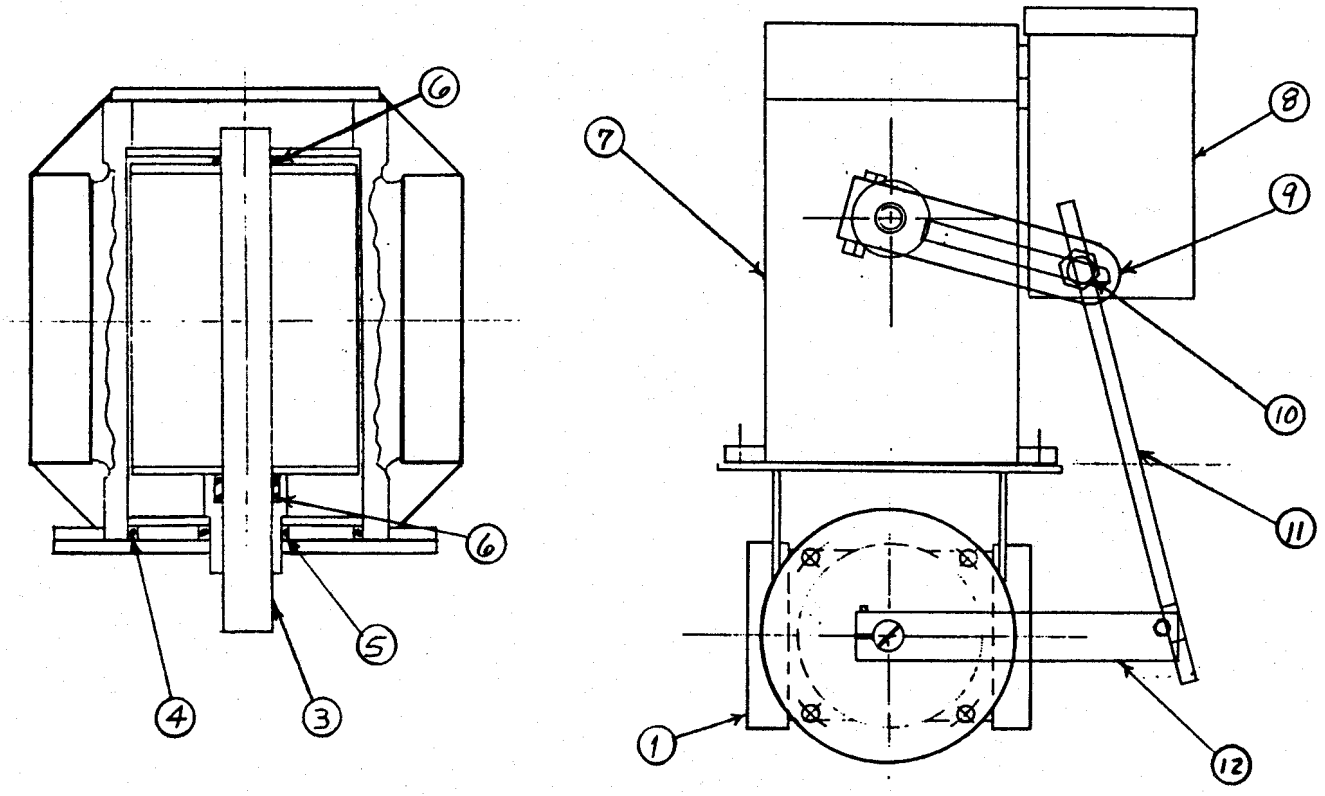
FOR HU-60-1105B



REF.	QUAN.	PART NO.	DESCRIPTION
1	1	13460A	Spray Chamber, S.S.
2	1	12029B	Air Discharge Hood, S.S.
3	2	13805	Handle
4	1	13911A	Air Deflector Sheet
5	2	12156	Latch Assm.
6	1	12150D	Mist Eliminator Assm.
7	1	14745	Water Tank Screen
8	1	11068A	Float Ball, S.S.
9	1	11069	Brass Stem
10	1	14742	Water Float Valve, 3/4
11	24	13900	Water Spray Nozzles, S.S.
12	2	14774	Header Pipe, S.S.

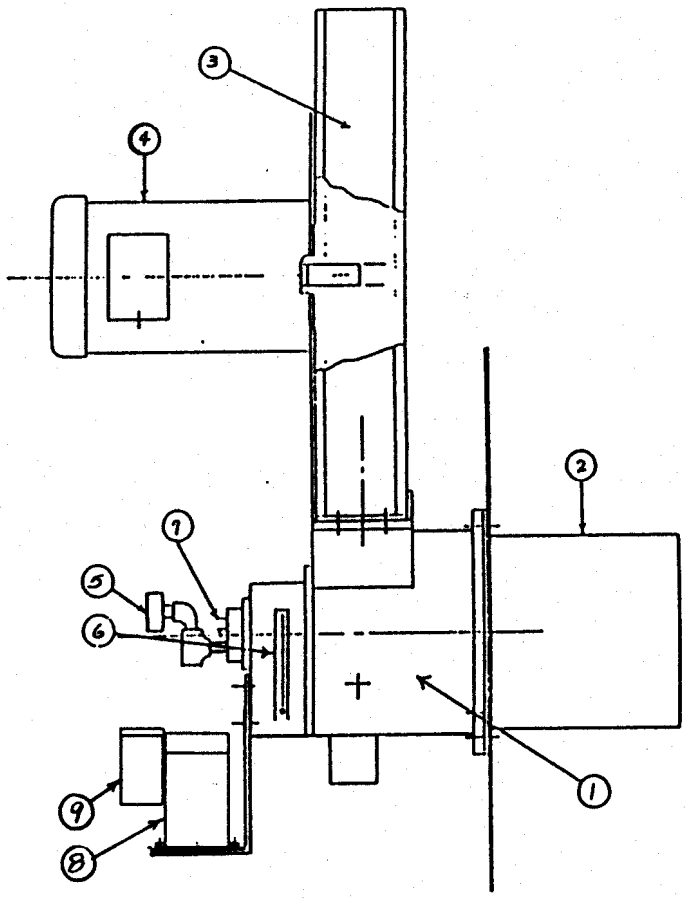
14980

BUTTERFLY WATER VALVE WITH MODULATING MOTOR



REF.	QUAN.	PART NO.	DESCRIPTION
1	1	14981	Valve body assm.
3	1	14990	Valve core assm.
4	1	15601	O-ring, 2 1/4 ID
5	1	15602	O-ring, 3/4 ID
6	3	15603	O-ring, 1/2 ID
7	1	14824	Water valve actuator
8	1	14831	Electronic drive
9	1	14841	Crank arm
10	1	14842	Straight arm fitting
11	1	14843	Rod
12	1	14952	Crank arm

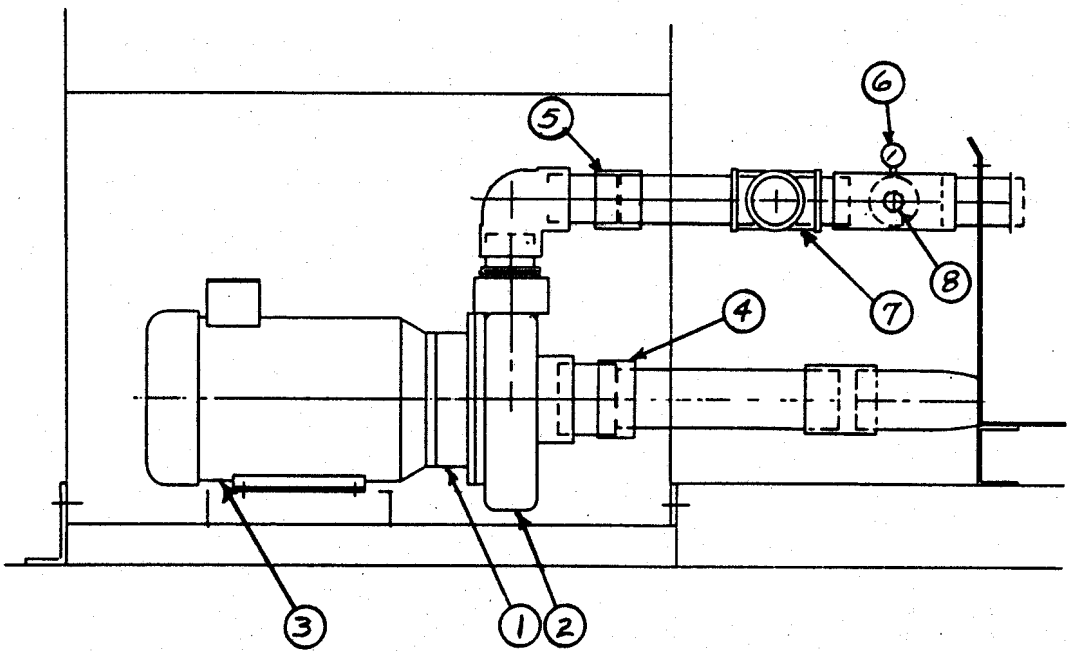
OIL BURNER ASSEMBLY



REF.	QUAN.	PART NO.	DESCRIPTION
1	1	14400	BURNER COMPLETE
2	1		BURNER SLEEVE
3	1	14390	BURNER FAN IMPELLER
3A	3	14395	IMPELLER BELTING, 50HZ
4	1	14375	FAN MOTOR, 2 HP
5	1	13244	FUEL NOZZLE SUB. ASSEMBLY
5A	1	13706	AIR PRESSURE GAGE
6	1	13319	FUEL FLOW METER, 2-20GPH/10-150LPN
7	1	12794	U-V FLAME SCANNER
8	1	14830	FUEL MODULATOR
9	1	14831	ELECTRONIC DRIVE
NOT SHOWN:			
	1	14200	SPARK IGNITION
	1	9991	FUEL STRAINER
	1	9992	SCREEN FOR 9991

WATER PUMP AND PIPE ASSEMBLY

FOR HU-60-1106B

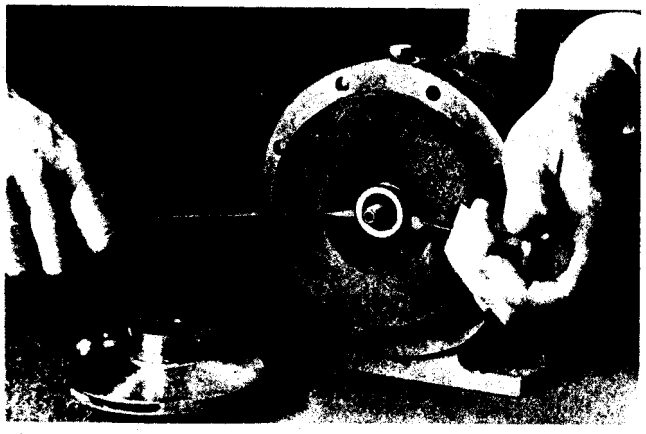


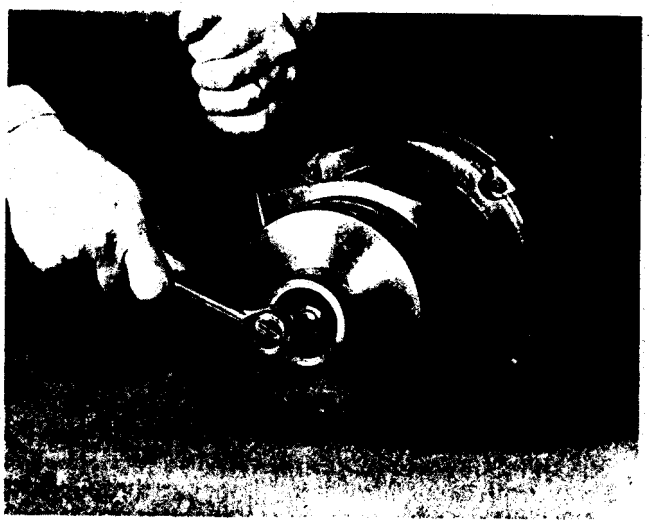
REF. NO.	QUAN.	PART NO.	DESCRIPTION
1	1	14971	Water pump and motor, 50 HZ
2	1	14973	Water pump less motor, 50 HZ
1	1	14970	Water pump and motor, 60 HZ
2	1	14972	Water pump less motor, 60 HZ
3	1	14975	Motor 4 HP, 50 HZ, 5 HP, 60 HZ
*	1	14794	Shaft seal
*	1	14869	Pump body o-ring
4	1	15406	No-Hub coupling, 2½ x 3 inch
5	1	15402	No-Hub coupling, 2 inch
6	1	11277B	Water pressure gage
7	1	14980	Water valve (see separate page)
8	1	14531	Water conductivity control electrode

*items not shown

WATER PUMP SHAFT

SEAL REPLACEMENT





II. REPLACING MECHANICAL SEAL

A) Dismantling:

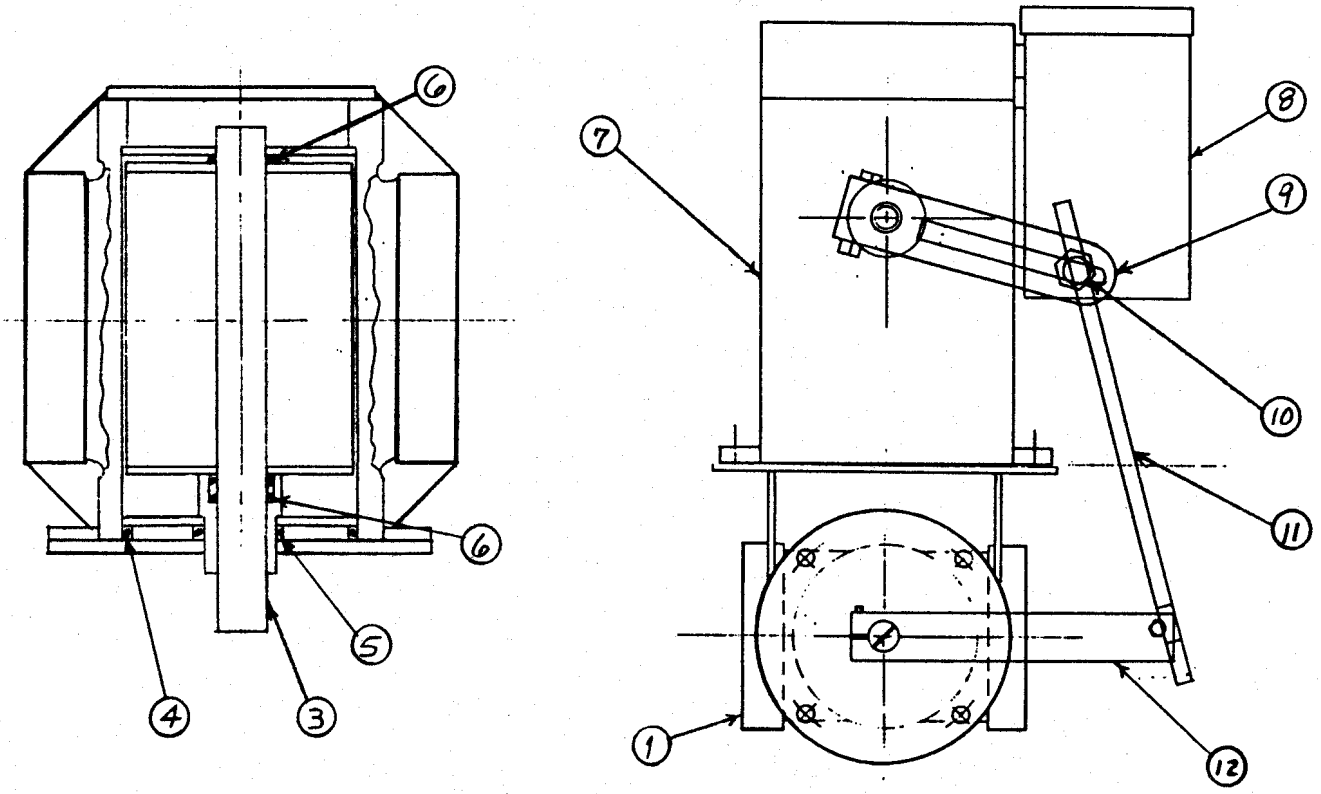
1. Turn off power.
2. Drain system.
3. Remove bolts holding motor to foundation.
4. Remove casing bolts.
5. Remove motor and rotating element from casing, leaving casing and piping undisturbed.
6. Insert a screwdriver in impeller waterway passage and remove impeller bolt with a socket wrench.
7. Remove washer and impeller from shaft. Be careful not to lose impeller key. If impeller is difficult to remove, it may be necessary to insert two (2) screwdrivers, between impeller and adapter, 180° apart, to pry off impeller.
8. Remove bolts holding adapter to motor. Remove adapter, pulling with it the rotating seal part from sleeve.
9. Place adapter on a flat surface. Push out stationary parts of mechanical seal.
10. Inspect shaft sleeve. If damaged, remove from shaft. Heat with torch and use a bearing puller.

B) Reassembly:

1. Clean parts, male and female locks, seal seat counterbore and shaft, in particular where sleeve fits (if sleeve was removed).
2. Spray both shaft sleeve fit and sleeve inside with LOCQUIC®, Primer "T"® — Loctite® product Item No. 74756. (Purchase at Automotive Parts or Hardware.) Let parts dry and then apply Loctite® #271 on same parts. Slide sleeve over shaft, twist sleeve back and forth a couple times. Wipe off excess and let cure according to manufacturer's instructions.
3. Lube counterbore of adapter and rubber bushing of stationary seat with water or light oil. Press stationary seat in counterbore squarely and evenly. Caution: Do not mar lapped face of seat.
4. With motor in vertical position, remount adapter on motor. Make sure motor shaft does not dislocate stationary seat of the seal.
5. Apply a thin coat of light oil or water to sleeve and rubber seal member of rotating seal. Slide rotating member of mechanical seal on sleeve. Attach spring. Be sure rotating seal face stays in the holding collar during installation. Take extra care not to damage the seal lapped faces.
6. Place key in keyway slot and slide impeller on shaft. Place impeller washer on impeller hub and start threading impeller bolt into motor shaft.
7. Insert a screwdriver in a waterway passage of the impeller. Hold from rotating and tighten bolt.
8. Remove burrs caused by screwdriver on periphery of impeller in waterway passages.
9. Slide motor and rotating element in casing. Be sure to replace damaged O-rings.
10. Tighten casing bolts alternately and evenly.
11. Replace hold-down bolts.
12. Check for free rotation after assembly is complete.
13. Close all drain openings. Use pipe joint compound on male threads.
14. Reprime before starting. Do not start unit until pump is completely filled with water.

14980

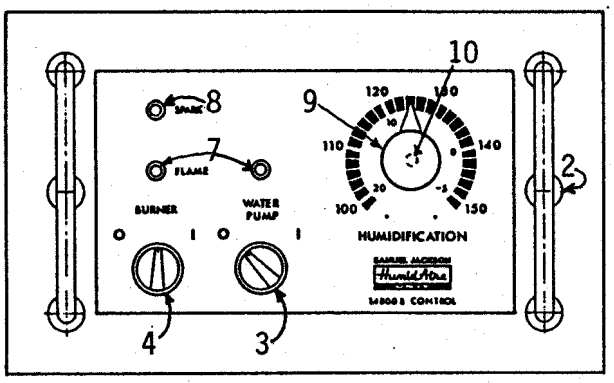
BUTTERFLY WATER VALVE WITH MODULATING MOTOR

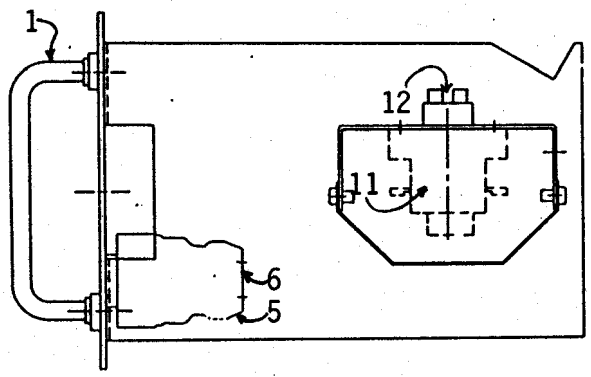


REF.	QUAN.	PART NO.	DESCRIPTION
1	1	14981	Valve body assm.
3	1	14990	Valve core assm.
4	1	15601	O-ring, 2 1/4 ID
5	1	15602	O-ring, 3/4 ID
6	3	15603	O-ring, 1/2 ID
7	1	14824	Water valve actuator
8	1	14831	Electronic drive
9	1	14841	Crank arm
10	1	14842	Straight arm fitting
11	1	14843	Rod
12	1	14952	Crank arm

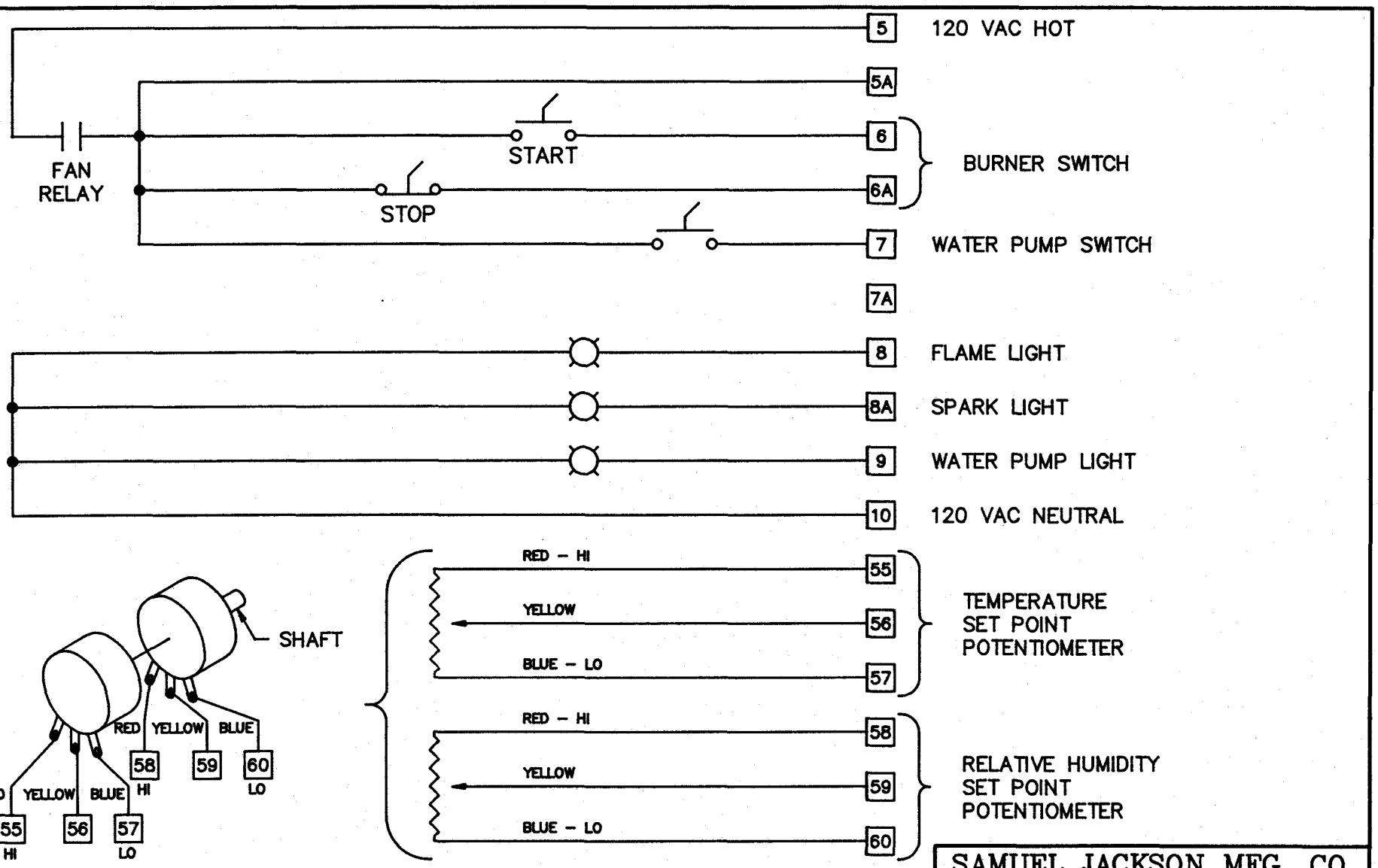
14800B AUTOMATIC CONTROL

FOR HUMIDAIRE UNIT





REF.	QUAN.	PART NO.	DESCRIPTION
1	2	13805	Handle
2	2	13811	Latch, Adjustable Grip
3	1	14805	Selector Switch, Less contact
4	1	14495	Selector Switch, Less contact
5	2	14448	Contact, NO
6	1	14449	Contact, NC
7	2	~~14361~~	Pilot Light, Amber
8	1	14839 ~~14362~~	Pilot Light, Red
9	1	14850	Pointer Knob
10	1	14807	Potentiometer, Dual
11	1	13150	Fan Relay, 220V Coil
		13149	Fan Relay, 120V Coil
		13151	Fan Relay, 440V Coil
12	16	14665	Barrier Strip, 1.5 mm

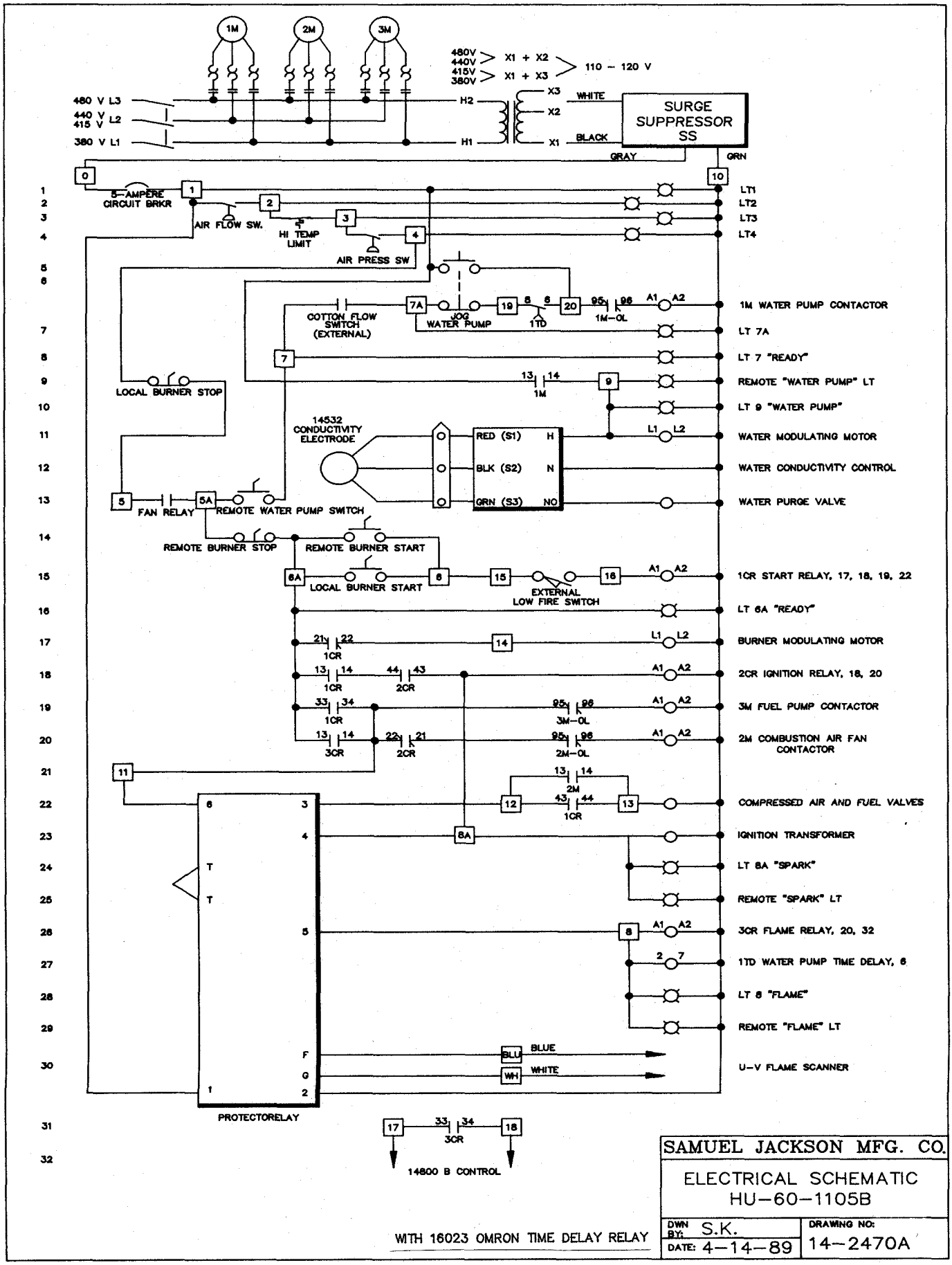


10–14807
DUAL 400 OHMS
POTENTIOMETER

SAMUEL JACKSON MFG. CO.

ELECTRICAL SCHEMATIC FOR
14840 REMOTE CONTROL
REF: 14800B

DWN. BY G.F.E	DRAWING NO. 14–2525
DATE 11–88	

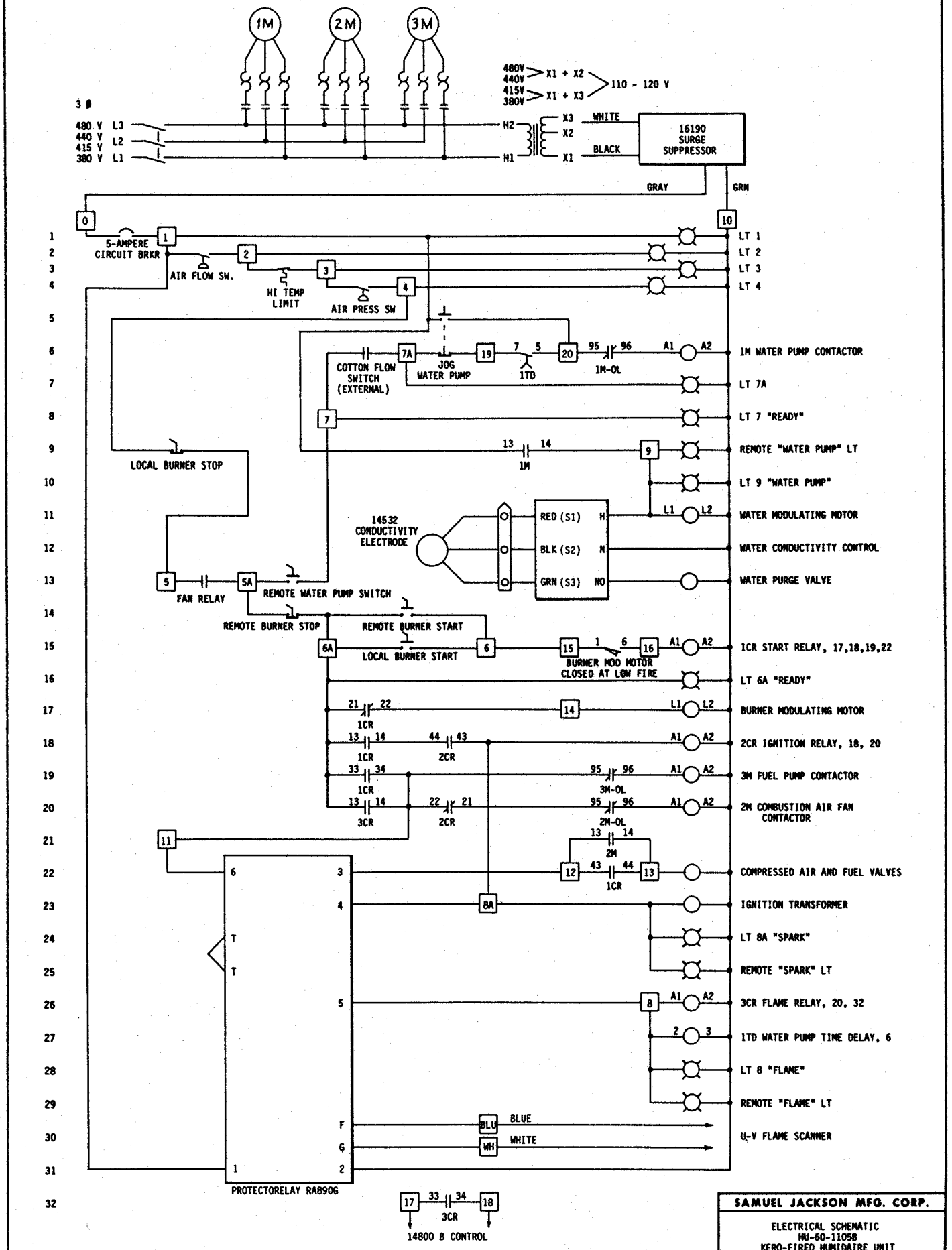


SAMUEL JACKSON MFG. CO.

ELECTRICAL SCHEMATIC
HU–60–1105B

WITH 16023 OMRON TIME DELAY RELAY

DWN BY: S.K.	DRAWING NO:
DATE: 4–14–89	14–2470A

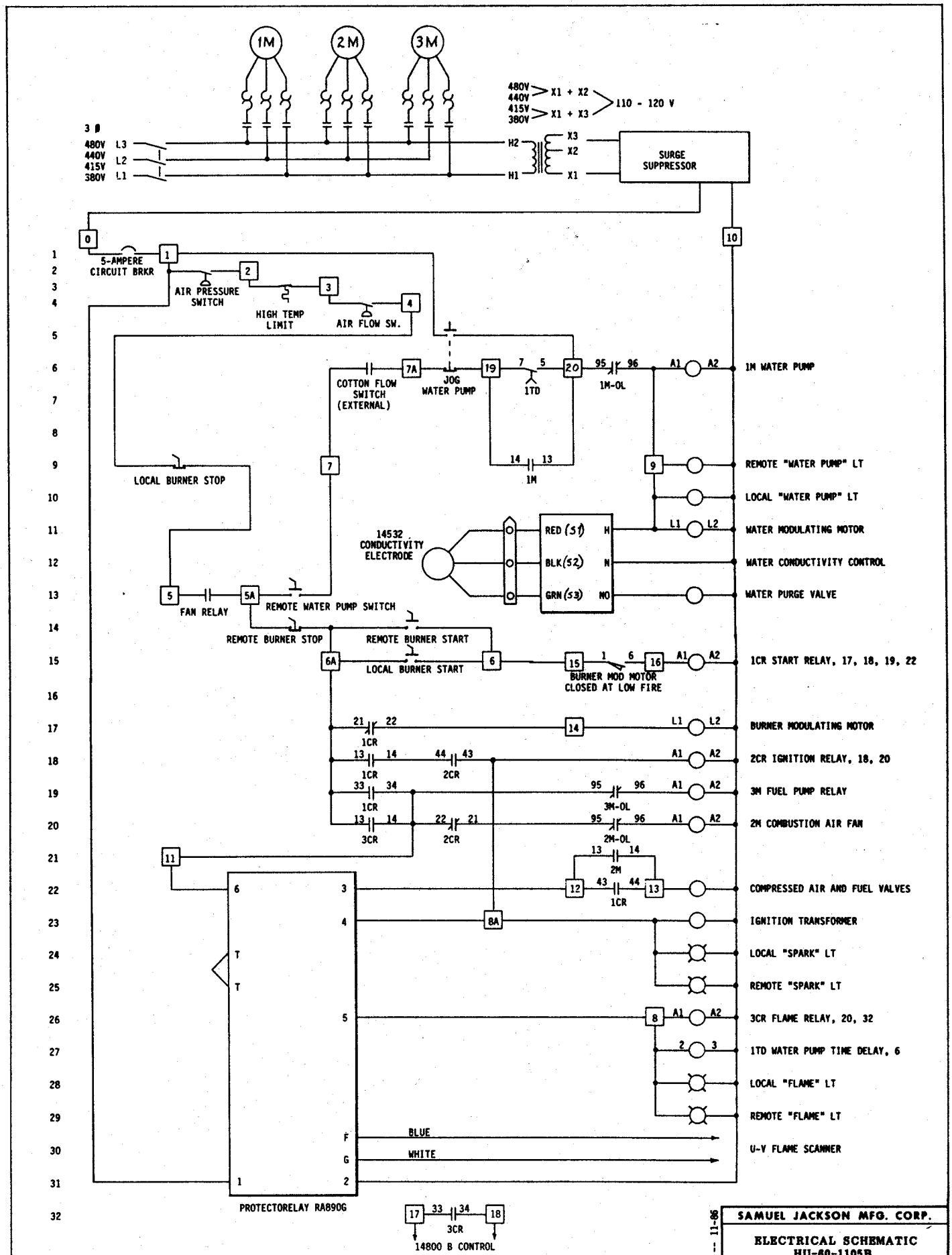


WITH 16061 TIME DELAY RELAY

SAMUEL JACKSON MFG. CORP.

ELECTRICAL SCHEMATIC
HU-60-1105B
KERO-FIRED HUMIDAIRE UNIT
SERIALS 4946 - 4953

DWN. BY	SGJ	DRAWING NO.
DATE	2-87	14-2470



SAMUEL JACKSON MFG. CORP.	
ELECTRICAL SCHEMATIC HU-60-1105B KERO-FIRED HUMIDAIRE UNIT SERIALS 4944 & 4945	
"A" REVISION -- 11-86	
DWN. BY SGJ	DRAWING NO. 14-2451A
DATE 3-86	

SAMUEL JACKSON MANUFACTURING CORP.

THE LINT SLIDE GRID

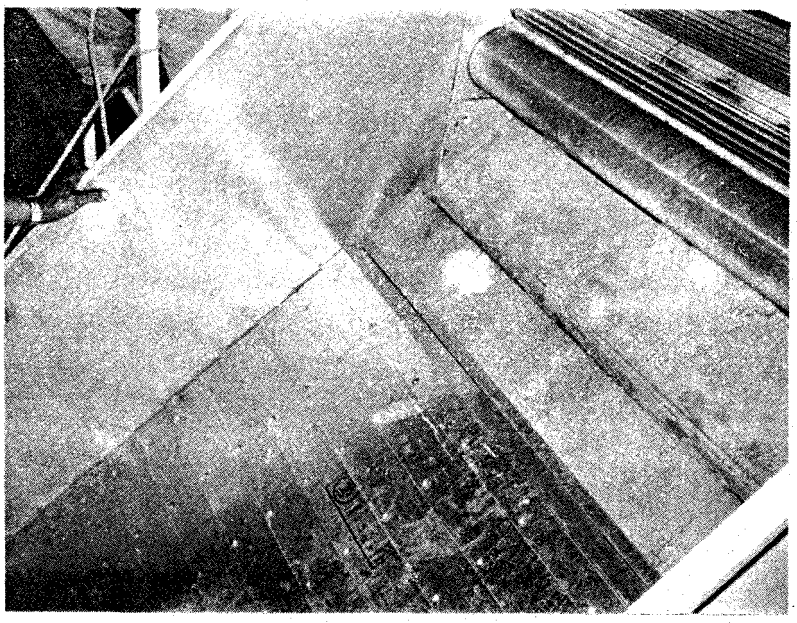
The LSG-1070 Lint Slide Grid is used to humidify cotton as it passes down the lint slide to the baling press. It is composed of metal crosspieces which overlap to form louver-like openings. Humid air, introduced through the floor of the lint slide beneath the grid, issues from these openings and passes upward through the batt of cotton, adding moisture to it. The overlapping arrangement of the grid slats not only helps to push the cotton down the slide, but prevents the accumulation of pin trash beneath the grid.

PURPOSE The reasons for adding moisture in this way are to reduce strain on the tramper and press and eliminate problems with broken straps or bale ties. To do this the moisture content of the cotton is typically brought up to between 6 and 8½ per cent. The weight added is typically 15 pounds (7 Kilos) per bale. The added 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.

INSTALLATION PROCEDURE is shown in Drawing 14-2306. Note that the two bolt holes in each end of the air inlet are utilized to bolt in place the two 13362 diffuser ends. The 13361 diffuser sheet is bolted under the upper flanges of the diffuser ends.

CONDENSER AIR SWITCH CONTROL This device is usually 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 pressure in the condenser riser and inside the condenser drum.

HOOD OVER LINT SLIDE A useful modification is now being used in many gin plants. The lint slide is covered with a hood to collect the used moist air and pieces of floating lint which would otherwise escape into the air. The collected moisture is returned to the riser below the battery condenser. The normal vacuum of the lint flue is sufficient to pull in this air. The slide is left uncovered near the condenser for outside air to enter. This hood arrangement allows more humid air to be used in the grid without causing a housekeeping problem. It also gives the cotton double exposure to the humid air, and kills static electricity in the battery condenser. Drawings of typical hood designs are available on request. Samuel Jackson Mfg. does not make such hoods. They are made by the cotton gin manufacturers and local sheet metal contractors.

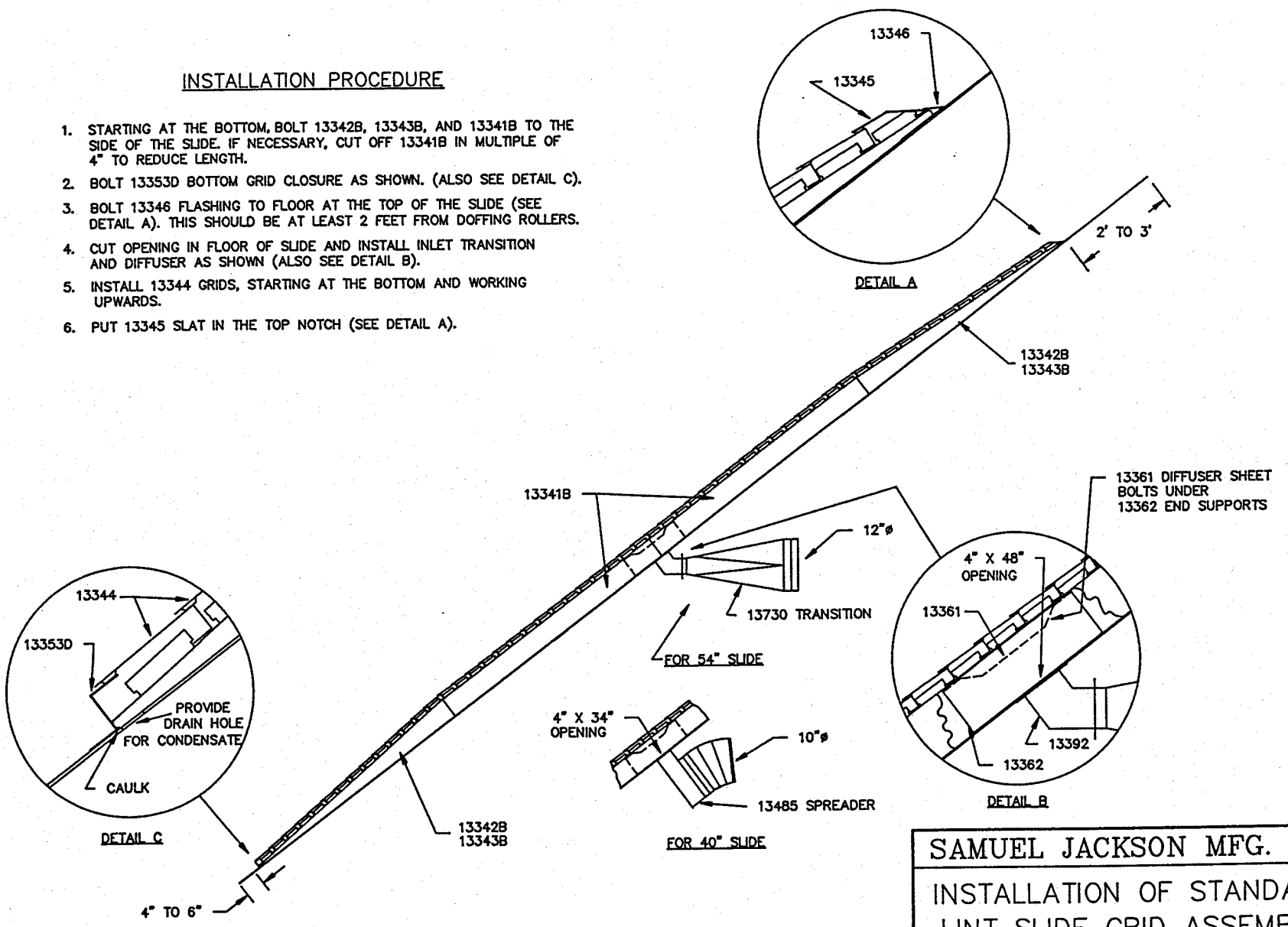


SAMUEL JACKSON MANUFACTURING CORP
P O BOX 16587 --- LUBBOCK, TX 79490
TEL 806-795-5218

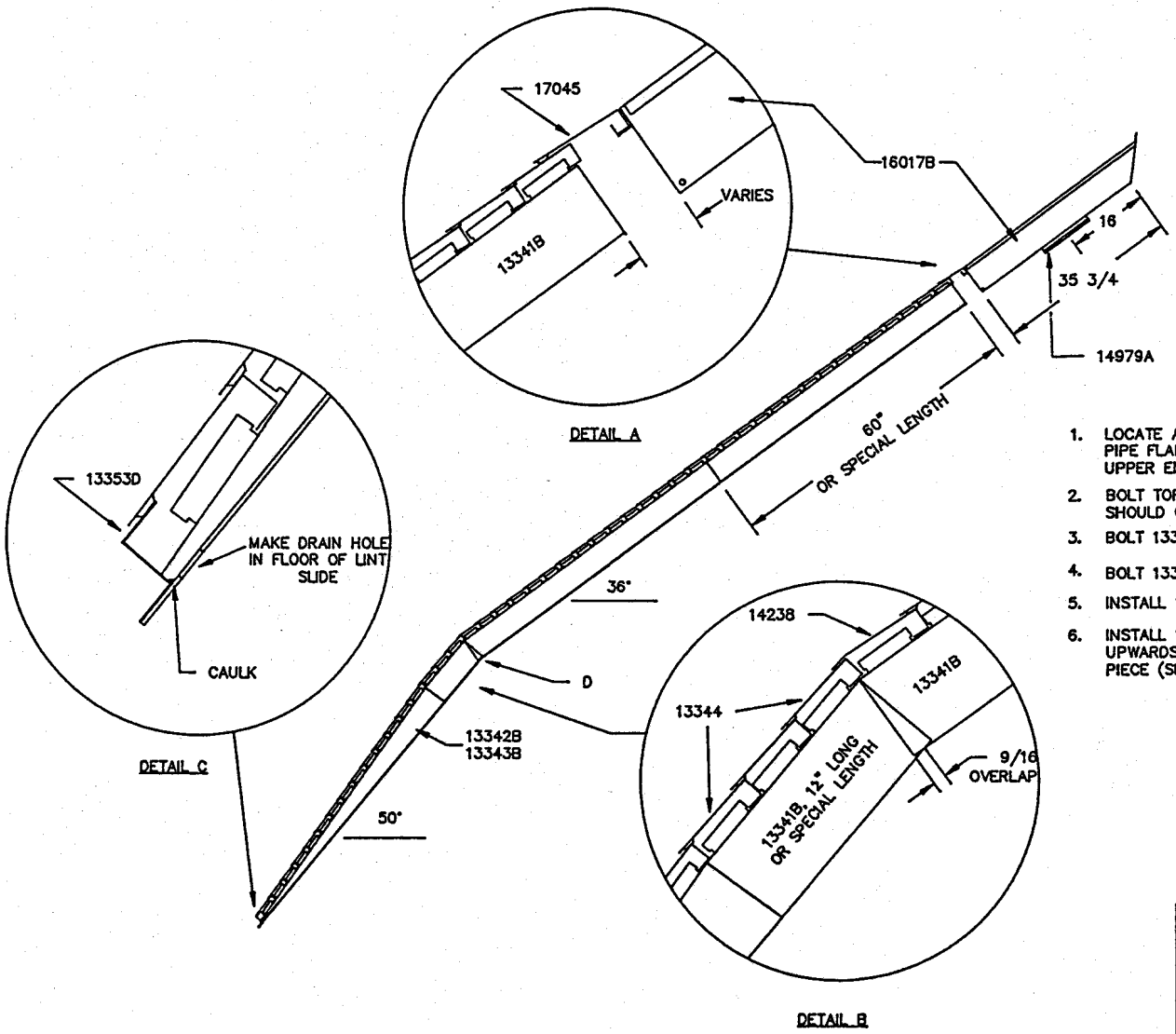
44-2360

INSTALLATION PROCEDURE

1. STARTING AT THE BOTTOM, BOLT 13342B, 13343B, AND 13341B TO THE SIDE OF THE SLIDE. IF NECESSARY, CUT OFF 13341B IN MULTIPLE OF 4" TO REDUCE LENGTH.
2. BOLT 13353D BOTTOM GRID CLOSURE AS SHOWN. (ALSO SEE DETAIL C).
3. BOLT 13346 FLASHING TO FLOOR AT THE TOP OF THE SLIDE (SEE DETAIL A). THIS SHOULD BE AT LEAST 2 FEET FROM DOFFING ROLLERS.
4. CUT OPENING IN FLOOR OF SLIDE AND INSTALL INLET TRANSITION AND DIFFUSER AS SHOWN (ALSO SEE DETAIL B).
5. INSTALL 13344 GRIDS, STARTING AT THE BOTTOM AND WORKING UPWARDS.
6. PUT 13345 SLAT IN THE TOP NOTCH (SEE DETAIL A).



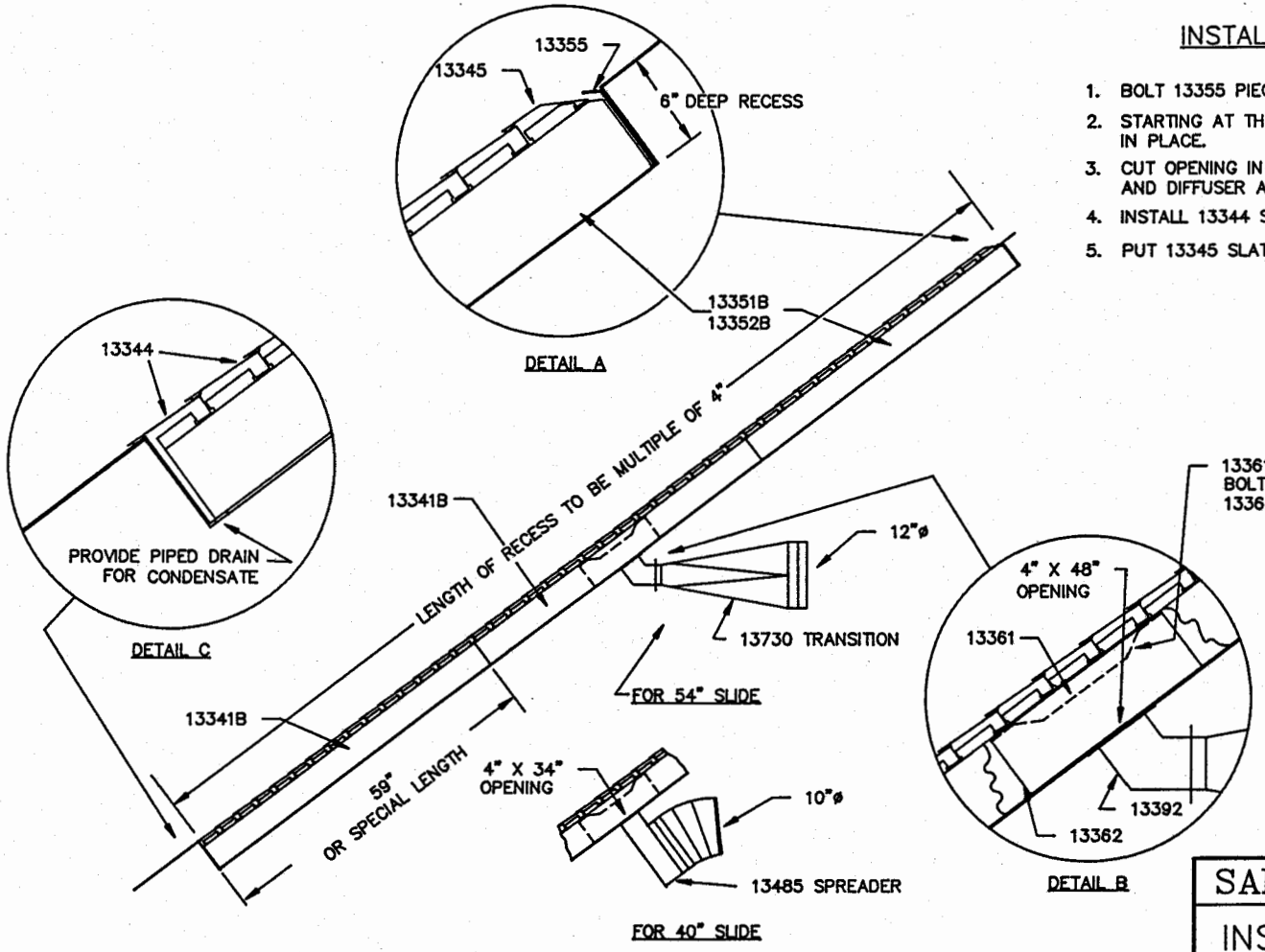
SAMUEL JACKSON MFG. CO.	
INSTALLATION OF STANDARD LINT SLIDE GRID ASSEMBLY	
REF: LSG	
DWN. BY SK	DRAWING NO. 14-2558
DATE 6-29-89	



INSTALLATION PROCEDURE

1. LOCATE AND CUT HOLE IN LINT SLIDE FLOOR FOR 14979A 12" DIA PIPE FLANGE. THIS HOLE SHOULD BE CENTERED ON THE SLIDE AT THE UPPER END, AS SHOWN. INSTALL THE 12" FLANGE.
2. BOLT TOP DIFFUSER SHEET (PART NO. 16017B) IN PLACE. THIS SHEET SHOULD CAULKED AT THE TOP.
3. BOLT 13341B PIECES IN PLACE, STARTING AT POINT D. SEE DETAIL B.
4. BOLT 13342B AND 13343B PIECES IN PLACE.
5. INSTALL 13353D BOTTOM GRID CLOSURE. SEE DETAIL C.
6. INSTALL 13344 GRIDS, STARTING NEAR THE BOTTOM AND WORKING UPWARDS, USING 14238 AT THE HUMP AND FINISHING WITH 17045 PIECE (SEE DETAIL A).

SAMUEL JACKSON MFG. CO.	
INSTALLATION OF LUMMUS LINT SLIDE GRID ASSEMBLY	
REF: LSG	
DWN. BY SK	DRAWING NO. 14-2453
DATE 6-29-89	



INSTALLATION PROCEDURE

1. BOLT 13355 PIECE IN PLACE.
2. STARTING AT THE TOP, BOLT 13351B, 13352B, AND 13341B PIECES IN PLACE.
3. CUT OPENING IN FLOOR OF SLIDE AND INSTALL INLET TRANSITION AND DIFFUSER AS SHOWN (ALSO SEE DETAIL B).
4. INSTALL 13344 SLATS STARTING AT THE BOTTOM. (SEE DETAIL C)
5. PUT 13345 SLAT IN TOP NOTCH (SEE DETAIL A).

SAMUEL JACKSON MFG. CO.

INSTALLATION OF RECESSED LINT SLIDE GRID ASSEMBLY

REF: LSG

DWN. BY SK	DRAWING NO. 14-2557
DATE 6-28-89	

COST OF OPERATING

THE HUMIDAIRE UNIT AT THE LINT SLIDE

We are often asked how much it costs to operate the Humidaire Unit and how the cost compares to the value of the benefits received. We have calculated below some typical examples using three different fuels. For a more accurate analysis, insert your fuel cost and other data and recalculate. All three examples assume that the Humidaire Unit is operating at full output and fuel consumption of 1,500,000 Btu/hr. A more reasonable estimate would be one half as much fuel consumption.

We have assumed a 10-hp (7.5kW) motor will be used to move the humid air. We have not provided for amortizing the cost of the installation. We simply note that the first season's return will usually be several times the total installed cost. We have not put any dollar value on benefits other than added weight of moisture, such as not having to repack broken bales, savings on bagging and ties by making larger bales and reduced repairs to tramper, press and press pump due to lower packing force required.

NATURAL GAS

Cost of fuel: $\frac{(1{,}500{,}000 \text{ Btu/hr}) \times (4.80 \text{ \$/M cu ft})}{1{,}000{,}000 \text{ Btu/M cu ft.}}$ = \$7.20 per hour

Cost of electric power: $\frac{(12 \text{ horsepower}) \times (.13 \text{ \$/kW hr})}{1.34 \text{ hp/kW}}$ = 1.16 per hour

\$8.26 per hour

If the hourly ginning rate is 20 bales of 480 net pounds each, and the moisture content is increased by three per cent (from four to seven) the added weight is 288 pounds per hour. If cotton is worth \$.70 per pound, this amounts to \$202 per hour, a net increase of \$193 per hour or \$9.65 per bale. If 10,000 bales are ginned, this gives \$96,500 for the season.

PROPANE

Cost of fuel: $\frac{(1{,}500{,}000 \text{ Btu/hr})}{(91{,}000 \text{ Btu/US gallon})}$ = 16.5 gal/hr X .65 \$/gal = \$10.72 per hour

Cost of electric power: $\frac{(12 \text{ horsepower}) \times (.13 \text{ \$/kw hr})}{(1.34 \text{ hp/kW})}$ = 1.16 per hour

Total cost \$11.88 per hour

If the hourly ginning rate is 20 bales of 480 net pounds each, and the moisture content is increased by three per cent (from four to seven) the added weight is 288 pounds per hour. If cotton is worth \$.70 per pound, this amounts to \$202 per hour, a net increase of \$190 per hour or \$9.50 per bale. If 10,000 bales are ginned, this gives \$95,000 for the season.

14-2402-1 1-84

COST OF OPERATING -- PAGE 2

The following examples are in metric units:

PROPANE

Cost of fuel: $\frac{380{,}000 \text{ Cal/hr}}{6062 \text{ Cal/liter}}$ = 62.7 l/hr X .17 $/l = $10.66 per hour

(62.7 liters/hr = 31.9 kilos/hr)

Cost of electric power: (9 kW) X (.13 $/kW hr) = 1.17 per hour

Total cost $11.83 per hour

KEROSENE

Cost of fuel: $\frac{380{,}000 \text{ Cal/hr}}{8320 \text{ Cal/liter}}$ = 45.7 liters/hr X .23 $/liter = $10.51 per hour

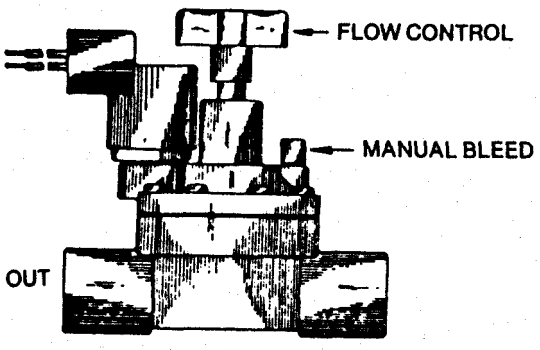
Cost of electric power: (9 kW) X (.13 $/kW hr) = 1.17 per hour

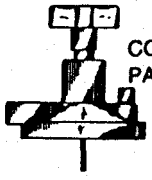
Total cost $11.68 per hour

In both of the examples above, if the hourly ginning rate is 20 bales of 220 net kilos each, and the moisture content is increased by three per cent (from four to seven) the added weight is 132 kilos per hour. If cotton is worth $1.54 per kilo, this amounts to $203 per hour, a net increase of about $191 per hour or $9.60 per bale. If 10,000 bales are ginned, this gives $96,000 for the season.

14783

WATER PURGE VALVE



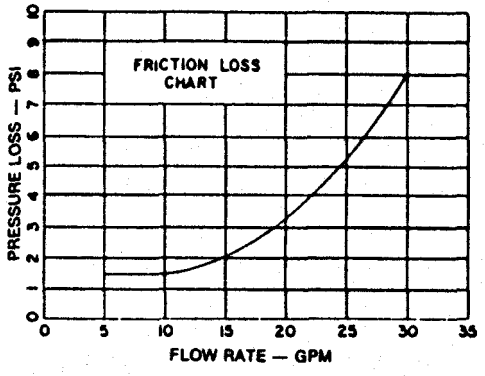

COVER ASSY.
PART #SV-CA

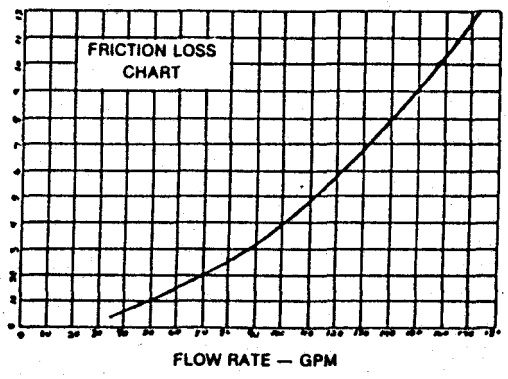

CONDUIT ADAPTOR
PART #SV-CDA


DIAPHRAGM ASSY.
PART #SV-DA


SOLENOID ASSY.
(includes adaptor)
PART #SV-O


BODY ASSY.
PART #SV-CBA





INSTALLATION INSTRUCTIONS

The SV-1 and SV-2 solenoid valves can be plumbed in any position and have a flow adjustment control and can be operated manually or electrically.

Note: Either valve should have a minimum of 20 psi differential pressure to operate. For cooling tower bleed off this means that when bleeding off to atmosphere pressure 20 psi or more should be available in the supply line. It is always good practice to install a Y strainer ahead of the solenoid valve.

Where static pressures are found to be 150 PSI or greater, it is advisable to use a pressure regulator with any automatic valve. To assure uniform and controllable operating conditions, it is necessary to regulate high pressure systems.

Step 1. Flush line thoroughly before installing valve. Use teflon pipe tape or standard pipe compound for thread sealant, on male threads.

Step 2. Screw valve onto supply pipe threads hand tight. Use wrench only to straighten valve into position.

Step 3. Screw outlet pipe into valve with wrench, hold valve by hand as outlet pipe is tightened.

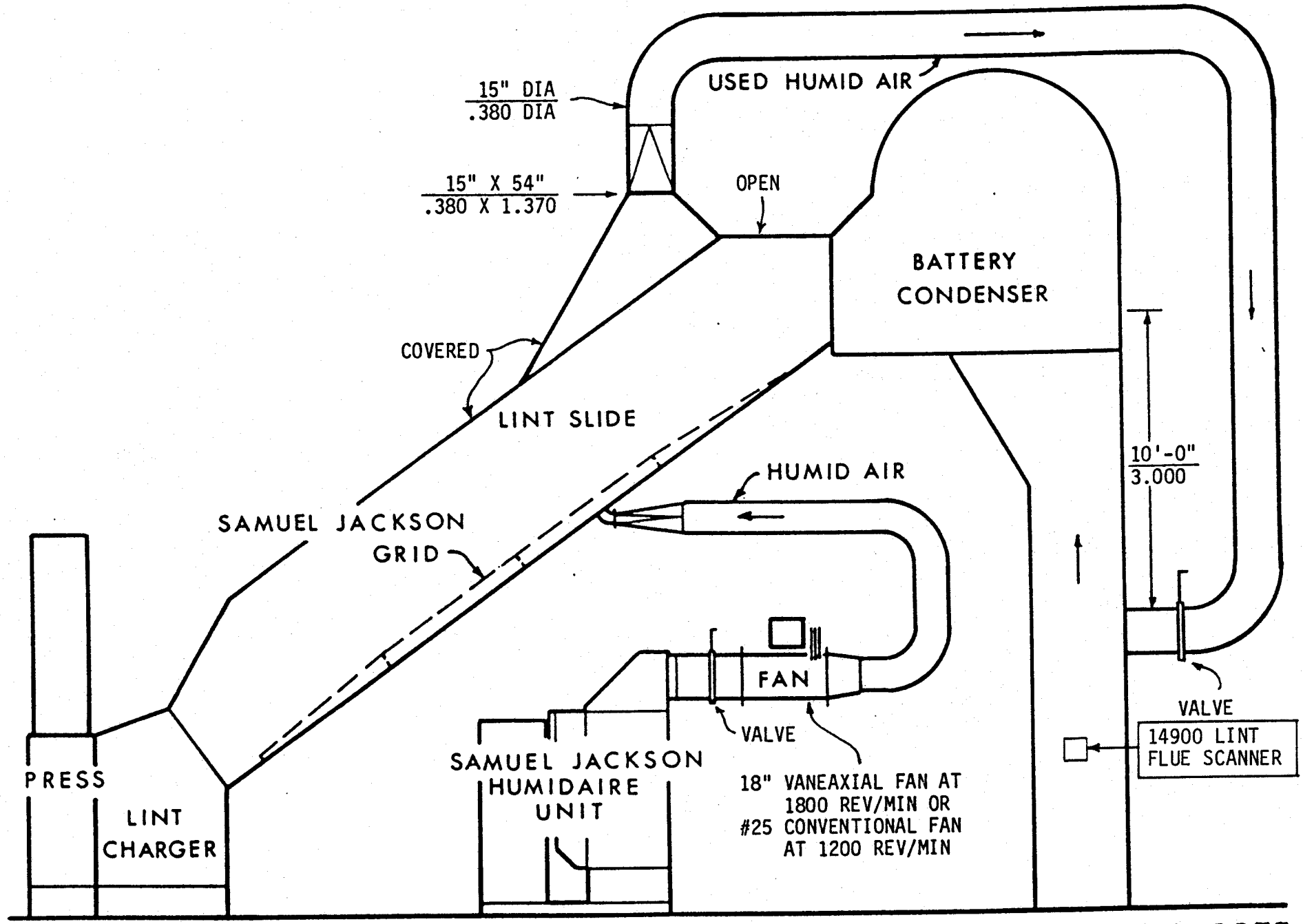
Step 4. Use 18 gauge solid wire plastic jacketed thermostat control wire for runs not over 800 feet and 16 gauge over 800 feet. Be sure all splices are soldered or joined with wire nuts and sealed with vinyl cement or other suitable waterproofing cement. A conduit adaptor is provided for running wires in conduit if desired.

Step 5. Turn flow control clockwise until it seats, closing the valve. Turn water supply on. The valve will remain closed.

Step 6. Turn manual bleed screw counterclockwise. This will allow water to flow through the valve as the flow control is backed out; adjust the flow control for desired flow. Tighten manual bleed screw and valve will close within a minute. Remove flow control knob to discourage unauthorized adjustment.
NOTE: Due to varying regulations check your local codes.

OPERATING INSTRUCTIONS

Turn manual bleed screw counterclockwise and valve will open. Tighten manual bleed screw and valve will shut off within a minute.

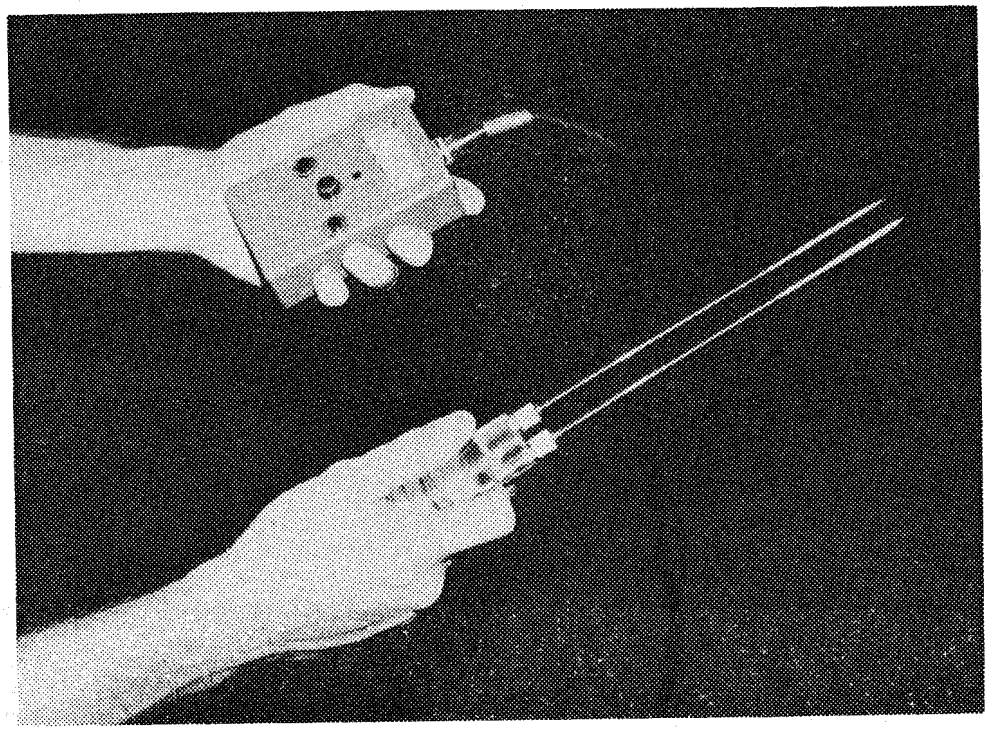


LINT SLIDE GRID INSTALLATION

14-2355

SAMUEL JACKSON MANUFACTURING CORP.

MODEL CM-1
COTTON MOISTURE METER



The Model CM-1 Cotton Moisture Meter (made by Delmhorst Instrument Company) is the best and most economical meter we have found to measure the moisture content of baled lint cotton. When using our Lint Slide Grid, it is not practical to take a sample from the slide to determine final moisture content. The bottom of the batt will have a much higher moisture content than the upper part. Once the cotton is baled, the moisture content becomes uniform, and can be quickly measured with the CM-1 meter and its bale probe. The probe is stabbed into the head or side of the bale, the "Read" button is pressed and the moisture content read from the "Lint Cotton" scale. This scale reads from 4 to 16 per cent. Specially insulated needles read internal moisture only, and are not affected by surface moisture or conductive bagging on the bale.

For measuring the moisture content of seed cotton, the 52-E cup electrode is available. The sample is pressed into the cup with the finger, the "Read" button is pressed and the moisture content read from the "Seed Cotton" scale. This scale reads from 6 to 20 per cent. This range is good for seed cotton coming into the gin plant, but is too high to use at the feeder aprons unless Samuel Jackson Conditioning Hoppers are being used.

SPECIFICATIONS

Size: With cup electrode:
2-3/4 x 1-3/4 x 6-1/2 inches (70 x 42 x 168 mm)

Meter only:
2-3/4 x 1-3/4 x 5 inches (70 x 42 x 130 mm)

Weight: 1 pound (540 grams) with cup electrode

Batteries: Two 9-volt, NEDA 1604

Ranges: Lint Cotton 4-16%; Seed cotton 6-20%

SAMUEL JACKSON MFG CORP -- P O BOX 16587 -- LUBBOCK, TEXAS 79490 -- TEL 806-795-5218