



SERVICE MANUAL

HU-60-1106C
GAS FIRED
HUMIDAIRE UNIT
WITH 17040 CONTROL



SAMUEL JACKSON MANUFACTURING CORP.

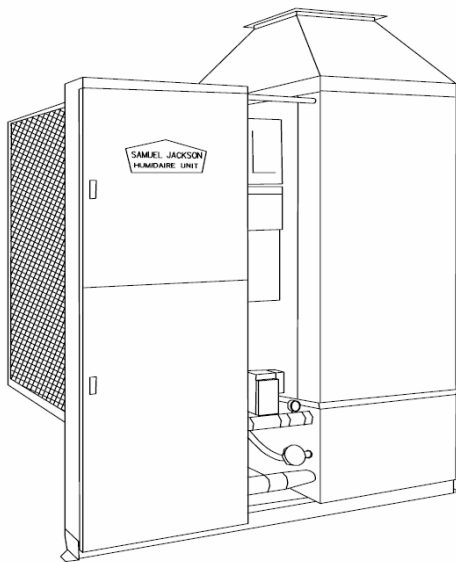
LUBBOCK, TEXAS 79490

HU-60-1106C Humidaire Unit Specification

February 28, 2008

The specifications for several discontinued Humidaire models have been changed. This specification replaces all previous specification information.

Burner Input Capacity (maximum)	1.5 Million Btu/hr
Burner Input Capacity (normal operation)	800,000 Btu/hr
Gas Consumption (full throttle)	15 CCF Nat Gas/17.8 Gal/Hr LPG
Gas Consumption (normal operation)	5.6 CCF Nat Gas/6.64 Gal/Hr LPG
Heating efficiency (air and water)	1700 Btu/lb water at 2900 CFM
Evaporation (maximum)	2 US gallons/minute
Evaporation (normal operation)	1.1 gallons/minute
H2O Purge (fresh H2O at 15 grains/US gal)	.4 - .5 US gallons/minute (600 gal/24 hrs)
Recommended water supply	5 US gallons/min at 15 PSI – 30 PSI
Std Electrical Power	480/60, 380/50, 415/50



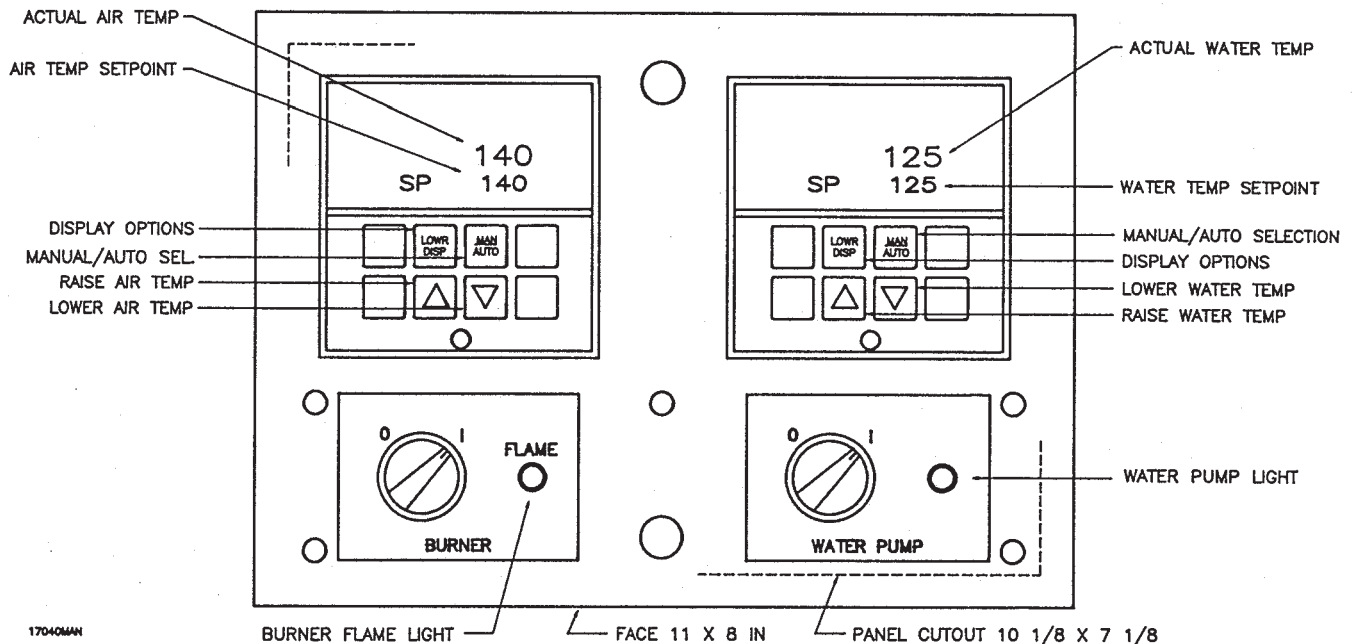
The Samuel Jackson Humidaire Unit generates warm humid air which carries water vapor to cotton fibers in a form which is quickly and uniformly absorbed. Samuel Jackson Humidaire Units have been in extensive use since 1959.

Moist air from Humidaire Units is applied to seed cotton to preserve fiber properties in dry conditions. It is applied to lint cotton to improve bale press efficiency and to enjoy stable bale weights and bale opening characteristics.

Humidaire Units comes in various sizes, fuel types, and efficiencies. In choosing the model best suited for your need, we recommend first determining the method you wish to apply the moist air to the cotton with. Following this decision, heating fuel (gas or oil), air volume, and efficiency will narrow the choices to the one that best matches the need.

In reviewing the specifications, verify availability of power, fresh water supply, fuel type, and provision for water drainage. "Normal Operation", as noted in the specifications, refers to air temperature of 125 F and water temperature of 120 F with moist air volume of 2,900 CFM.

17040 DIGITAL CONTROL FOR HUMIDAIRE UNITS



The 17040 Digital Control is used to control the HU-60-1106C Humidaire Unit. In some special cases, it will be used to control earlier models. This powerful control can be used on units installed at the lint slide, in conditioning hoppers or in drying systems.

LINT SLIDE, CONDENSER AND CONDITIONING HOPPER APPLICATION -- The controller allows the temperature of the air which is applied to the cotton and the water temperature in the Humidaire Unit to be controlled independently. This is especially helpful in lint slide or condenser applications to avoid condensation. The air temperature will normally be left constant at about 115 F (45C). The water temperature set point will be increased for more humidification and reduced for less. The water temperature closely approximates the wet-bulb temperature of the air, so the closer the two temperatures come together, the higher the relative humidity will be. The constant temperature of the lint slide or condenser will help avoid condensing moisture on cold surfaces.

It will not be possible to raise the actual water temperature to more than about 3 deg F above the air temperature. If this does not produce enough humidification, or if moisture condenses, raise the air temp set point to 125 F (50C). Always compare the actual temperatures with the setpoints. If the air temp will not reach the air temp setpoint, you may need a larger burner orifice. If the water temp will not come close to the air temp, the water nozzles may need cleaning to give a uniform spray pattern. Naturally, the amount of moisture addition will also depend on the way it is applied to the cotton (lint slide grid, condenser, etc.).

DRYING SYSTEM APPLICATION -- The comments above apply, except that the air temperature sensor should be installed after the air has been mixed with the seed cotton, but ahead of or in the top of any tower dryer. This will allow the burner to operate without the water pump as an ordinary drying system, or with the water pump it will humidify. In this application, it will be possible to raise the water temperature above the air temperature.

CAUTIONS -- The water pump and its controller will not energize until a digital time delay (normally set to 90 seconds) in the Humidaire cabinet has run its course. This preheats the system to avoid condensation when first started. The Lint Flue Scanner will also prevent operation of the water pump until cotton is flowing through the system. After the burner and water pump start, the setpoint of either controller can be changed by simply pressing its up-arrow or down-arrow.

Each controller shows the actual temperature as the upper display. To see the control output to either the burner or water valve, press the "LOWR DISP" button twice. To override the automatic control, press the "MAN/AUTO" button and use the arrow keys to position the valve between 0 and 100 percent open. This is strictly an emergency procedure. Only four buttons on each controller are visible. Do not remove the other button protectors and adjust the controller settings without consulting the factory.

TROUBLESHOOTING TIPS

HU-60-1106C

PROBLEM

1. Humidair Unit completely dead

POSSIBLE CAUSES AND REMEDIES

Humid air fan not on.

Air flow choked off.

Air flow switch not functioning. Verify air flow switch operation by seeing that air flow light on local panel is on when humid air fan is running.

Electric power supply is off.

2. Burner will not light

See if problem 1 applies.

Press reset button on protectorelay.

Check incoming gas pressure, 3 psi min.

See if terminal 6 is energized.

See if "L" relay in Protectorelay pulls in. If not, see if flame electrode is grounded or its wire burned and grounded. 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.

3. Burner goes off and relights

Air flow switch adjustment.

Low voltage may affect protectorelay.

Flame electrode may be coated. Scrape it.

Flame may not be contacting flame electrode. Bend it outward.

4. Burner lights, but will not modulate

Defective air temperature sensor. Look for "INPUT FAIL" message on air temp digital controller.

Low gas pressure due to taking gas supply from low-pressure regulator. Check incoming gas pressure, at least 3 psi.

PROBLEM

POSSIBLE CAUSES AND REMEDIES

4. (cont)

Defective gas valve actuator.
Using the air temperature digital controller, use the "Manual" button and the arrows to move the actuator from 0 to 100 percent. Observe the indicator on the bottom of the actuator for movement.

Defective main gas solenoid valve.

5. Water pump will not run

See if problem 1 applies.

Observe lights 7 and 7A on local panel. If light 7 is on and 7A is off, check adjustment of photoscanner in lint flue.

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.
- 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 may be blown in the distribution panel.

6. Water in humid air coming from unit--
As condensation

System should be preheated.

Air flow from Humidair unit choked down too much.

Cold air may be blowing on uninsulated pipes.

Increase temperature setpoint on air temperature digital controller.

Decrease water temperature setpoint on water temperature digital controller.

Not as condensation

Mist eliminator clogged with lint or scale.

PROBLEM

POSSIBLE CAUSES AND REMEDIES

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.

8. Water pressure not normal

Check for air leak on suction side of water pump. Verify proper operation of water temperature sensor by viewing display on digital temperature controller for the water. "INPUT FAIL" will flash on periodically if the sensor has failed. Water valve will remain closed.

Water level in tank may be so low that water pump sucks air. Verify that water purge valve is not stuck open and all drain valves are closed.

Water pump may be running backwards.

Verify proper operation of water valve by placing the water temperature digital controller in "Manual" and using the arrow keys to go from 0 to 100 percent. The water pressure should be between 30 and 35 psi at 100 percent and 4-5 psi at 0 percent.

TROUBLESHOOTING THE HU - 60 - 1106C

USING THE 16040 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.
3 on, 4 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.
4 on, 5 off	High temperature limit switch open. Clean the air inlet screen.
5 on, 6 off	Humid air fan relay or interlock not operating. Check fan operation and wiring at remote control.
5 on, 7 off	Same as above. Water pump switch turned off.
6 on, 8A off	(When holding burner selector switch in start position.) Safety switch in protectorelay has timed out. Press green reset button.
8A on, 8 off	Burner will not light. Check gas pressure. Need at least 3 psi. Clean spark plug tip. Check spark gap at 1/16 inch (1.5 mm). See if "L" relay in Protectorelay pulls in. If not, see if flame rod is grounded or if its wire is burnt and grounded.
7 on, 7A off	Cotton not flowing. Cotton flow switch not operating.
7A on, 9 off	Time delay relay 1TD still open. This timer allows the burner to run before the water to prewarm the system.

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 Humidair 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 Humidair Unit for this device to work.

ELECTRICAL INSTALLATION NOTES

THREE-PHASE SUPPLY TO HUMIDAIRE UNIT Run three-phase power to the Humidaire Unit from a 30-ampere fusible disconnect switch or circuit breaker which you will provide. A motor starter for the water pump motor is included in the Humidaire unit, as well as a stepdown transformer for 120-volt control power. Note that a time delay relay normally prevents the water pump from starting until the burner has operated for 90 seconds, but the water pump "Jog" push button will run the pump to check rotation. Look at the pump motor shaft to check proper rotation direction. If three phase voltage supplied does not correspond with that shown on the 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.

Wiring the 17040 automatic control to the Humidaire Unit is, for the most part, a wire by number operation. There are some things to note before connecting these. In addition, read the warnings below carefully.

The following rules need to be followed when wiring the thermocouple temperature sensors from the lint slide transition and the water tank to the 17040 automatic control.

- Always use thermocouple extension wire for the entire run from the thermocouple to the 17040 terminal block.
- Never run the thermocouple wires with power wiring (including 120 VAC control wires). You can run several T/C extension wires together in the same conduit with other wires marked sensitive on the external connection diagram.
- Observe the color code for thermocouple wire. Note that the red wire is negative and the white wire is positive.
- When wiring the thermocouples to the 17040 automatic control, it is absolutely critical to wire the water temperature thermocouple to terminals "T/CW" and the air temperature thermocouple to terminals "T/CA" on the 17040. Verify these connections before running the unit.

Please note that terminals 37, 38 and 39 on the 17040 controls do not have matching numbers on the Humidaire Unit. These terminals are spares reserved for future use.

WARNING!

THERMOCOUPLE WIRING If the water temperature thermocouple in the water tank and the air temperature thermocouple at the lint slide are connected to the wrong terminals on the 17040 automatic control, there is a possibility for **severe heat damage** to the Humidaira Unit. Read the wiring instructions carefully and verify the connections before operating the Humidaira Unit burner.

WARNING!

FAN INTERLOCK The installing electrician must supply and connect a normally open interlock from the Humid air fan between terminals 5 and 5A on the 17040 controller. Although every Humidaira Unit has an air flow switch, this interlock is an extra safety device. It turns off the burner instantly when the fan motor stop button is touched. For the location of this interlock, see the External Electrical Connections sheet included in this manual.

INSTALLATION NOTES AND INSTRUCTIONS HU-60 HUMIDAIRE UNIT

HOISTING When using a forklift to lift the Humidaire Unit, it is important to verify that the right fork is inside the special bracket welded to the frame of the Humidaire Unit. The center of gravity is behind the base of the spray chamber, and the unit will tip over if the bracket is not around the fork. If hoisting is desired, 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.

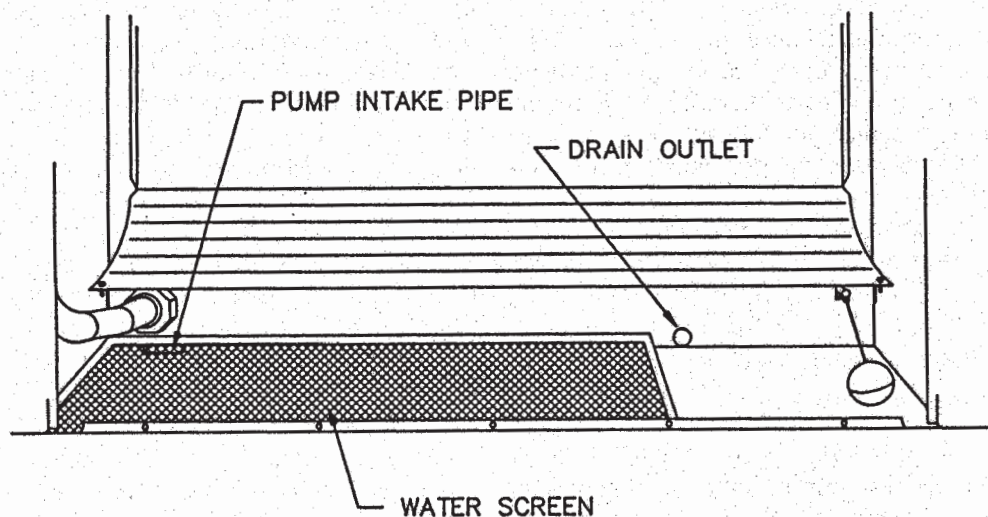
LOCATION If the location of the Humidaire Unit has not been specified on gin plans, it should be located in a clean place fairly close to the point of application of humid air. If the pipes are insulated (lagged), the humid air pipe can be run 80 to 100 feet (25 to 30 meters) without difficulty.

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.

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.

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 1. Remove the spacers provided which protect the float valve assembly during shipment.



WATER SCREEN PLACEMENT

FIGURE 1

INSTALLATION NOTES AND INSTRUCTIONS

HU-60 HUMIDAIRE UNIT

ELECTRICAL Electrical connections and troubleshooting are covered in the electrical section of this manual. The electrical supply required for the HU-60 is 480/60 (10 Amperes) in the U.S. and 380/50 (12 Amperes) in other countries.

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 startup). Ordinarily, 1-inch pipe will be adequate, but if more than one HU-60 is served or long distances are involved, refer to the gas pipe sizing guide included in this manual.

The burner capacity of the HU-60 is nominally 2-million BTU/Hr (500,000 Kg-Cal/Hr), but it can be increased to 3-million BTU/Hr for drying systems or reduced to 1-million BTU/Hr for short lint slide grids simply by changing the orifice disk 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 cubic ft/hour (57 cubic meters/hr); Propane -- 22 gal/hr (80 liters/hr or 47 Kg/hr).

For LPG (propane or butane) installation, 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.

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

WATER SUPPLY Connect a 1/2-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 percent 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.

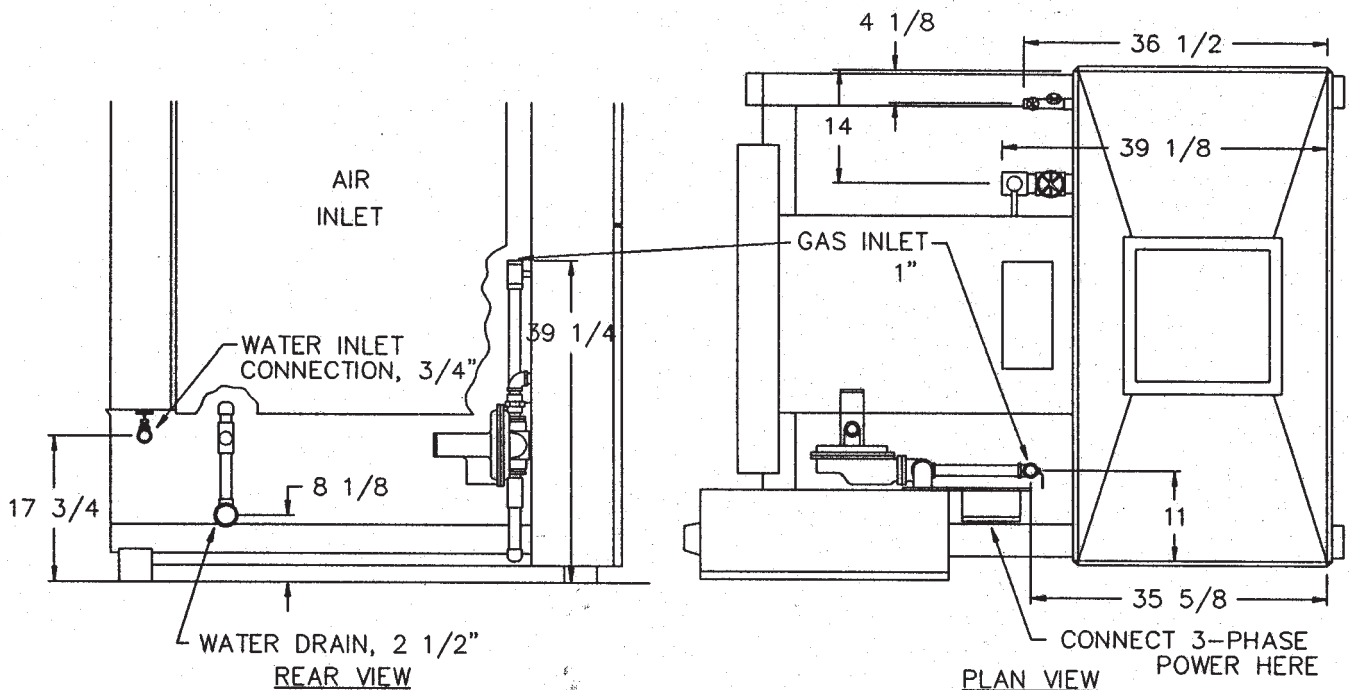
Some users have installed water softeners to minimize scale deposits in the HU-60. Make sure the softener cannot recharge while the HU-60 is running. If it does, the salt it puts in the water will cause corrosion damage far more expensive than scale accumulation. We can supply our No. 14000 Powdered 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 within 24 hours. These practices will not eliminate the need for the conductivity control bleed off system. Please see the conductivity control instruction sheet in this manual for details on this.

INSTALLATION NOTES AND INSTRUCTIONS HU-60 HUMIDAIRE UNIT

WATER DRAINAGE FACILITY The HU-60 drains water through a 2-inch pipe located behind the water tank. Drainage is absolutely necessary for proper operation of the HU-60 because the water evaporated by the HU-60 is distilled water. All minerals are left behind in the machine. A conductivity control continuously monitors the amount of dissolved minerals in the remaining water and when this level reaches an undesirable level, a purge valve opens releasing this water to the drainage pipe. As this occurs, the float valve replaces the purged water with fresh water. The amount of water drained will vary with the settings of the purge valve and conductivity control system but as a general rule, the drainage pit should be capable of accepting about 1000 gallons per day.

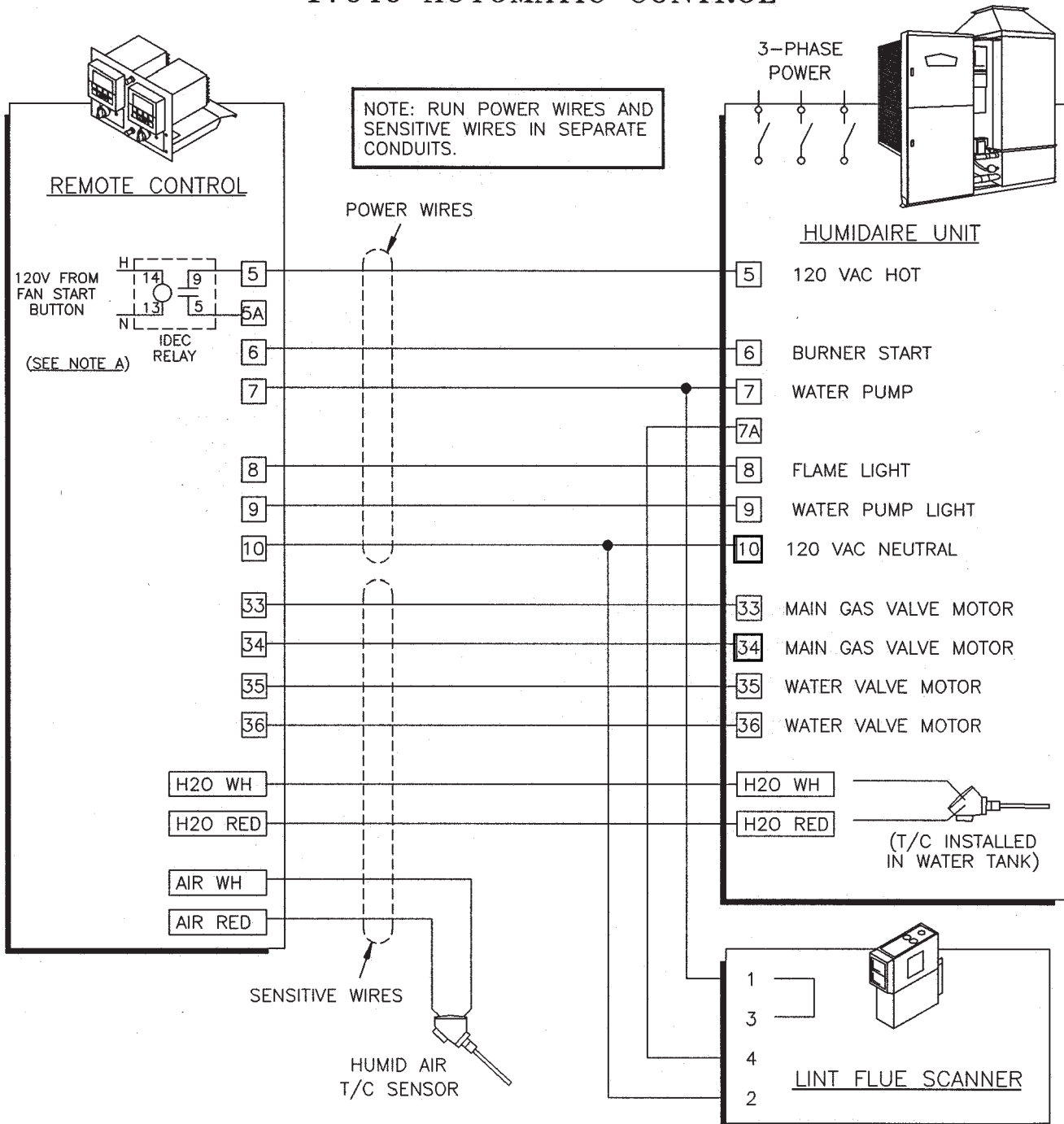
HU-INST.MAN 140290

NO.	DESCRIPTION	ROUTING AND NOTES
1	HUMIDAIRE UNIT 3-PHASE POWER	FROM ELEC SERVICE TO HUM UNIT. 3 WIRES, 480V, 5 HP 3/4 COND, 3 - 10 GA WIRES 480 V 30 A BREAKER. STARTER AND 120 V CONTROL TRANSF ARE IN HUM UNIT.
2	HUMIDAIRE UNIT CONTROL, A-C WIRES	HUM UNIT CABINET TO CONSOLE 1/2" COND, 7 - 16 GA WIRES.
3	HUMIDAIRE UNIT CONTROL, SENSITIVE WIRES	HUM UNIT CABINET TO CONSOLE 1/2" COND, 4 - 16 GA WIRES AND 2 PAIRS TYPE-J T/C WIRES ONE OF WHICH CONTINUES OVERHEAD TO INLET TRANSITION OF HUM AIR TO LINT SL GRID.
4	HUMIDAIRE UNIT LINT FLUE SCANNER. RUN OVERHEAD.	HUM UNIT CABINET TO SCANNER LOCATION IN LINT FLUE RISER. 1/2" COND, 3 - 16 GA WIRES. A-C WIRES. DO NOT SHARE CONDUIT WITH T/C WIRES.
5	GAS SUPPLY FOR HUM UNIT	1" GAS SUPPLY LINE. NATURAL GAS OR PROPANE. 5 TO 15 PSI, .3 TO 1.4 BARS. DO NOT RUN UNDER FLOOR.
6	WATER SUPPLY FOR HUM UNIT	3/4" WATER LINE, 20 PSI MIN.
7	WATER DRAINAGE LINE FOR HUMIDAIRE UNIT	2-1/2" PVC DRAIN PIPE, 1000 GAL PER 24 HOURS TYP



EXTERNAL ELECTRICAL CONNECTIONS HU-60-1106C WITH 17040 AUTOMATIC CONTROL

CAT 2123A
11-94



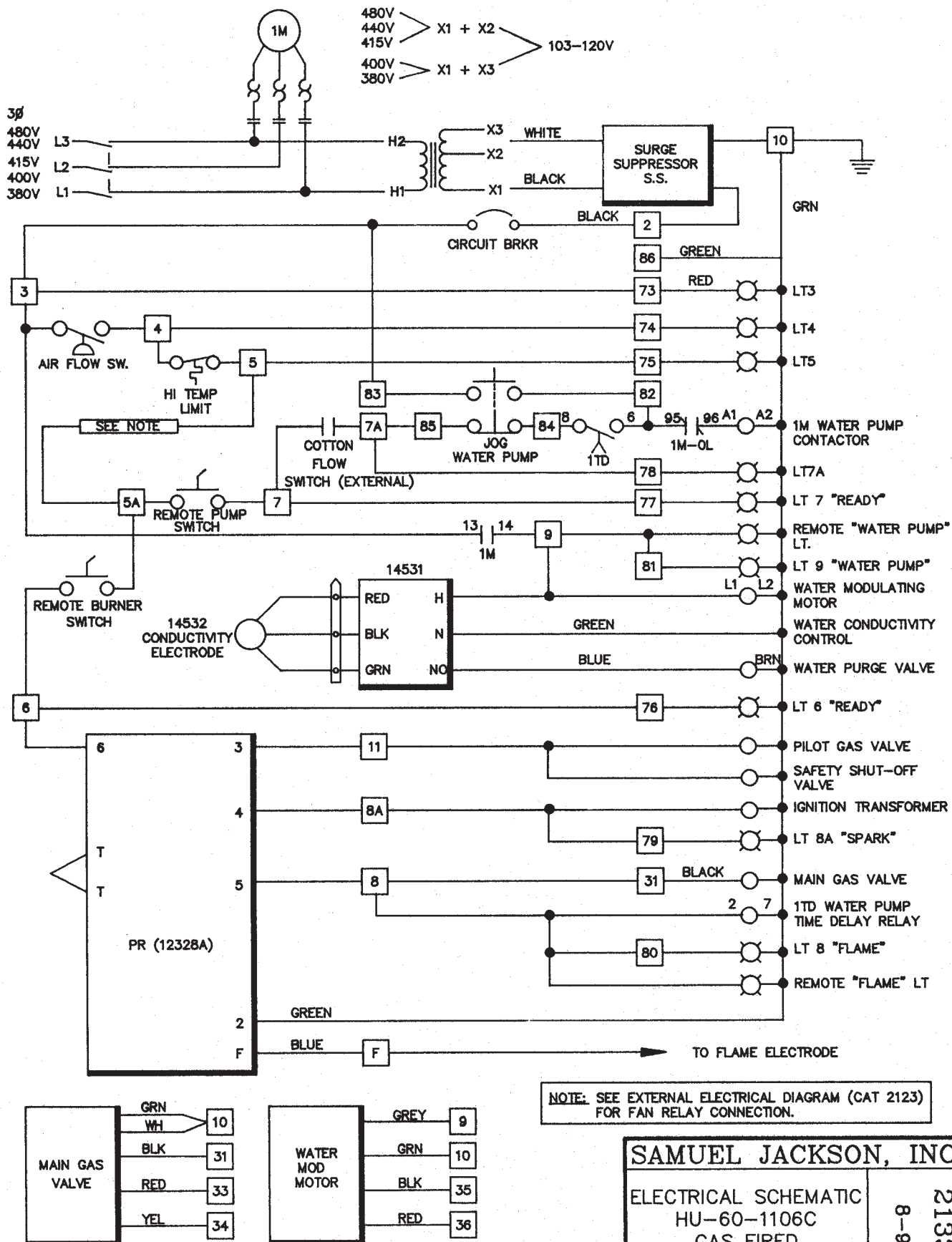
THERMOCOUPLE TEMPERATURE SENSORS

USE ONLY TYPE "J" THERMOCOUPLE EXTENSION WIRE FURNISHED WITH UNIT. OBSERVE THE COLOR CODE. RUN IN SEPARATE CONDUIT FROM POWER WIRES. SEVERAL T/C EXT. WIRES MAY BE RUN IN THE SAME CONDUIT.

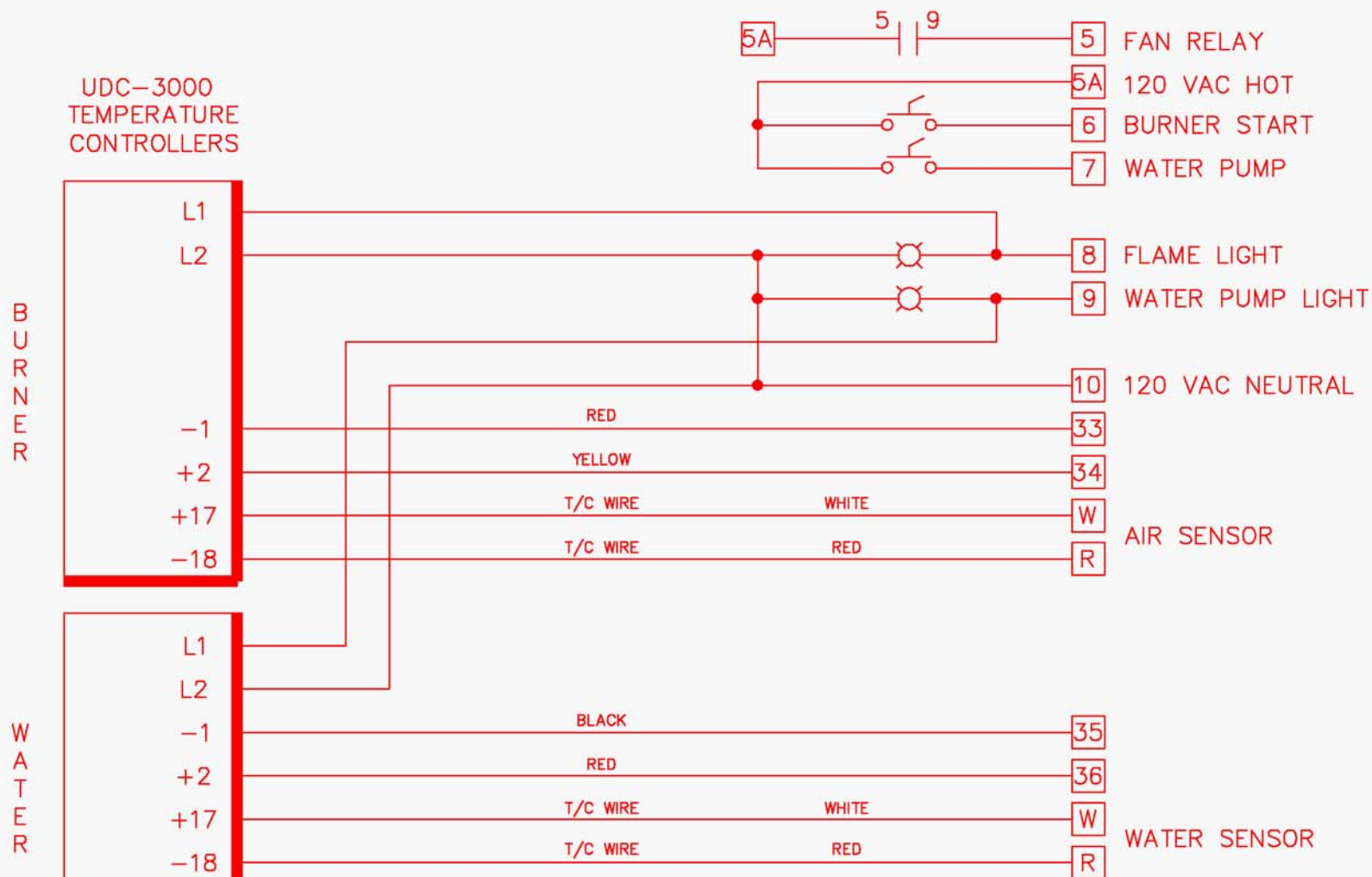
NOTE A: INSTALLING ELECTRICIAN IS RESPONSIBLE FOR CONNECTION OF A NORMALLY OPEN **INTERLOCK** (FURNISHED) TO THE HUMID AIR FAN.

REMOTE CONTROL REQUIRES A RECTANGULAR MOUNTING CUTOUT 10 1/8 WIDE X 7 1/8 HIGH.

FOR **BLUE UDC-3000 CONTROLS** MAKE THE FOLLOWING TERMINAL SUBSTITUTIONS:
10 FOR 23, 11 FOR 24, 18 FOR 27, AND 1 FOR 3.



DECAL FILED AS 10-17252B



SAMUEL JACKSON MFG. CO.

INTERNAL WIRING
FOR 17040

REF: 17040

DWN.
BY SK

DATE 1-3-92

DRAWING NO.

14-2576

OMRON

PHOTOELECTRIC SWITCH

OPERATION

TIME

STABILITY

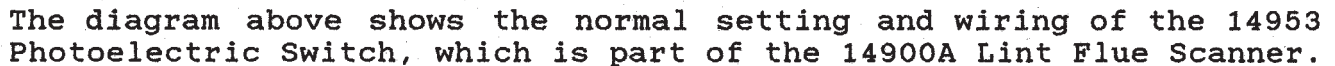
SENSITIVITY

LIGHT ON
DARK ON

OFF/D OFF/D

ON/D ON/D

NORM. JAPAN



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 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.

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.

*Reprinted with permission from NFPA 86-1985, Standard for Ovens and Furnaces, copyright © 1985, National Fire Protection Association, Quincy, Mass. 02269. This reprint of material is not the complete and official position of the NFPA on the referenced subject which is represented only by the standard in its entirety.

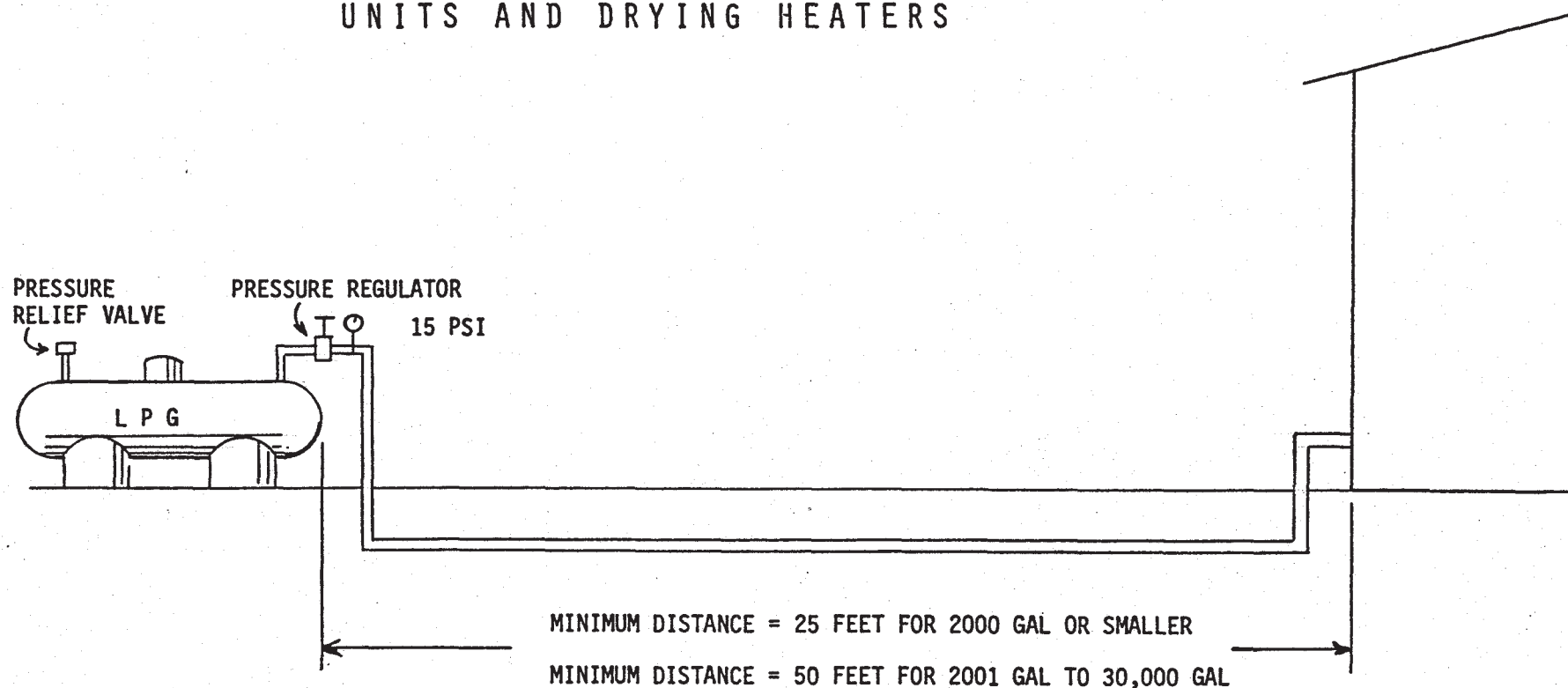
TOTAL HEATER CAPACITY MILLION BTU/HR	PIPE LENGTH FEET	RECOMMENDED MINIMUM PIPE SIZES				
		PRESSURE AT SERVICE REGULATOR OR VAPORIZER OUTLET, PSIG				
		NATURAL GAS			PROPANE*	
		6	10	15	10	15
2	100	1-1/4	1	3/4	3/4	3/4
	200	1-1/4	1	1	3/4	3/4
	500	1-1/2	1-1/4	1	1	3/4
4	100	1-1/2	1-1/4	1	3/4	3/4
	200	2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

* OR BUTANE

FILE 14-1899

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



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.

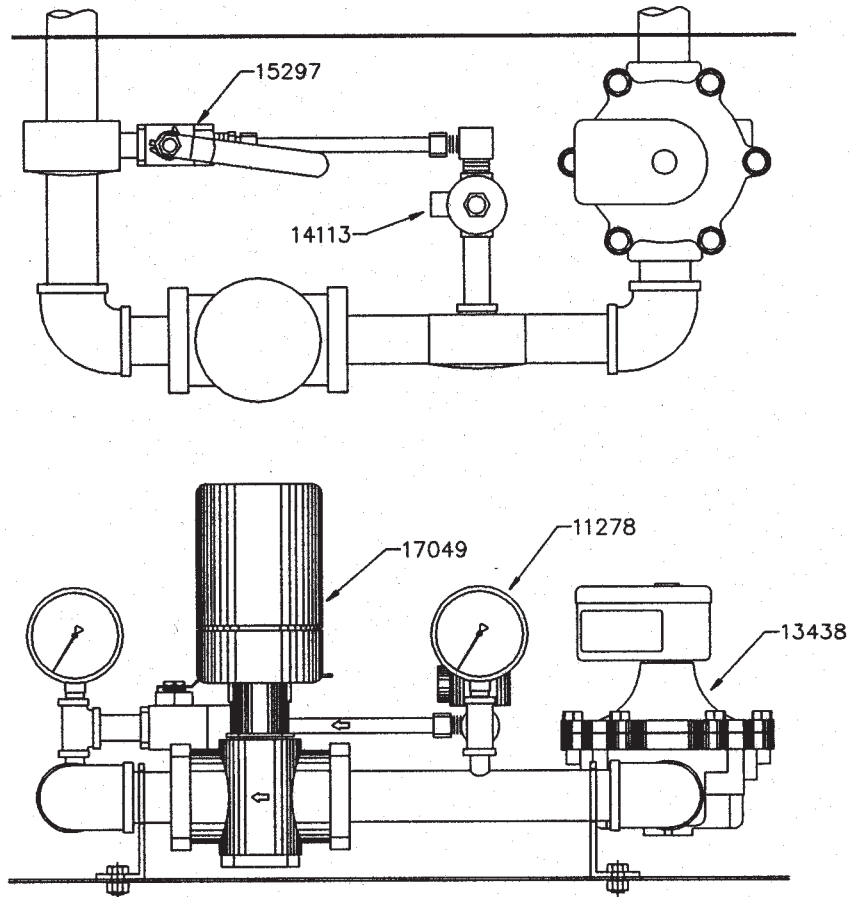
COMPONENT LIST **HU-60-1106C**

<u>SYMBOL</u>	<u>NAME</u> <u>PART NUMBER, MFR'S TYPE</u>	<u>LOCATION</u>
AF	AIR FLOW SWITCH 16188, PC-301	UPPER CABINET
CC	WATER CONDUCTIVITY CONTROL 14531, JA-153T-SJ-101	UPPER CABINET
CT	CONTROL VOLTAGE TRANSFORMER 16480, CLASS 5802, TYPE SBE, 50/60 HZ	BOX BELOW DISCONNECT SWITCH
DTC	DIGITAL TEMPERATURE CONTROLLER 16401, DC 3001-0-000-1-00	REMOTE CONTROLLER
EDV	ELECTRONIC DRIVE, CURRENT INPUT 14845, CP 8391-716	WATER VALVE
HTL	HIGH TEMPERATURE LIMIT SWITCH 14392 + 14393, SWITCH UNIT PB-10A, TEMPERATURE TRANSDUCER KJ-11A1	UPPER CABINET
GPG	GAS PRESSURE GAGE (2 ea.) 11278, 5# PR ¼, G22702	LOWER CABINET
GPR	GAS PRESSURE REGULATOR 11777, 243-8-1	BEHIND CABINET
IGT	IGNITION TRANSFORMER 11172, Webster 612-6A7	UPPER CABINET
IL	INDICATOR LIGHT (RED) 14839, 2150QA1	UPPER CABINET, REMOTE CONTROL
M1	WATER PUMP MOTOR, 5 HP 14975, JMM 3613T	LOWER CABINET
MC1	WATER PUMP MOTOR CONTACTOR 16854, 8502/PD 3.10E	UPPER CABINET
MOL1	WATER PUMP MOTOR OVERLOAD RELAY 14856, 9065/TR 5.5	UPPER CABINET
MM	MODULATING MOTOR 14824, MP-2110	WATER VALVE
PB	PUSH BUTTON LESS CONTACTS 14447, 3SBO2-PFB	UPPER CABINET

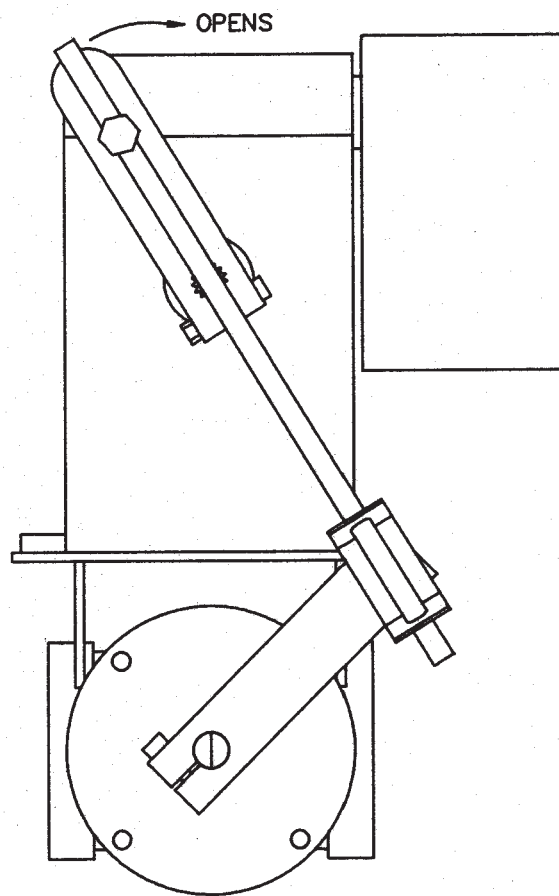
COMPONENT LIST - HU-60-1106C
PAGE 2

PR	PROTECTORELAY 12328A, RA890F 1254	UPPER CABINET
PV	GAS PILOT VALVE 14113, S311AF02N6CF5	LOWER CABINET
SS	SELECTOR SWITCH (2 POS MAINT) LESS CONTACTS 14805, 3SB02-2MKB	REMOTE, UPPER CABINET
SSNC	CLOSED CONTACT FOR SWITCHES 14449, 3SB1400-OC	UPPER CABINET
SSNO	OPEN CONTACT FOR SWITCHES 14448, 3SB1400-OB	REMOTE
SSOV	GAS SAFETY SHUT-OFF VALVE 13438, MJ8215-B-50	LOWER CABINET
TD1	PREHEAT TIME DELAY RELAY 16023, H3CA-8	UPPER CABINET
TCA	THERMOCOUPLE (AIR) 16900A, SK042589LH	DISCHARGE AIR
TCW	THERMOCOUPLE (WATER) 14660A, 2001-J-S-A10-6-U-5-0	WATER TANK
TCV	TEMPERATURE CONTROL VALVE 14834 & 14835, VS-9223-211-4-6	LOWER CABINET
TCVO	TEMPERATURE CONTROL VALVE OPERATOR 17047, MPR-5610	LOWER CABINET
WBV	WATER BUTTERFLY VALVE 14980A, BUTTERFLY	WATER PIPE
WCS	WATER CONDUCTIVITY SENSOR 14532, E-1A	WATER PIPE
WPG	WATER PRESSURE GAGE 11277B, 213-2- $\frac{1}{2}$, 0-60 PSI	WATER PIPE
WPV	WATER PURGE VALVE 14783, HR1-1	WATER PIPE
WP50	WATER PUMP, 50 HZ, LESS MOTOR 14973, 4BF50SJM	LOWER CABINET
WP60	WATER PUMP, 60 HZ, LESS MOTOR 14972, 48F60SJM	LOWER CABINET

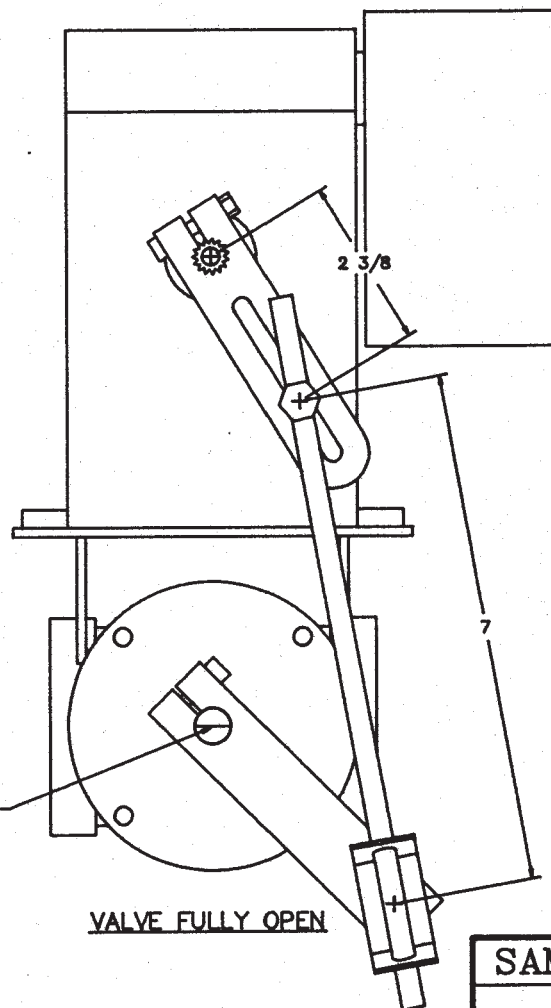
GAS TRAIN ASSEMBLY
HU-60-1106C HUMIDAIRE UNIT



<u>PART NO.</u>	<u>QTY USED</u>	<u>DESCRIPTION</u>
13438	1	Safety Shut-off Valve
11278	2	Gas Pressure Gage, 0-15 PSI
17049	1	17047 Actuator & 16888 Valve
14113	1	3/8 Pilot Valve
15297	1	3/8 Ball Valve



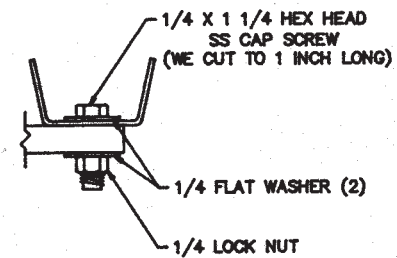
VALVE FULLY CLOSED



VALVE FULLY OPEN

NOTE: POSITION OF SLOT 'A' DENOTES
THE POSITION OF THE DISC INSIDE
THE VALVE.

3/8 SCALE



SAMUEL JACKSON MFG. CO.

LINKAGE ADJUSTMENT
WATER MOD MOTOR

REF: 1106C, 1105C

DWN.
BY SK

DATE 3-20-91

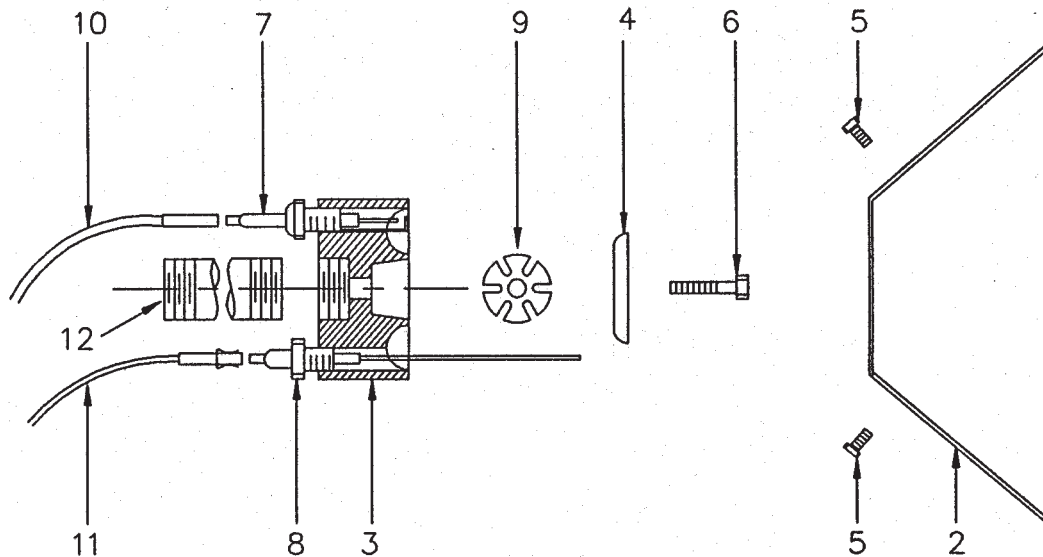
DRAWING NO.

14-2585

13480A BURNER HEAD ASSEMBLY

3131A

8-92



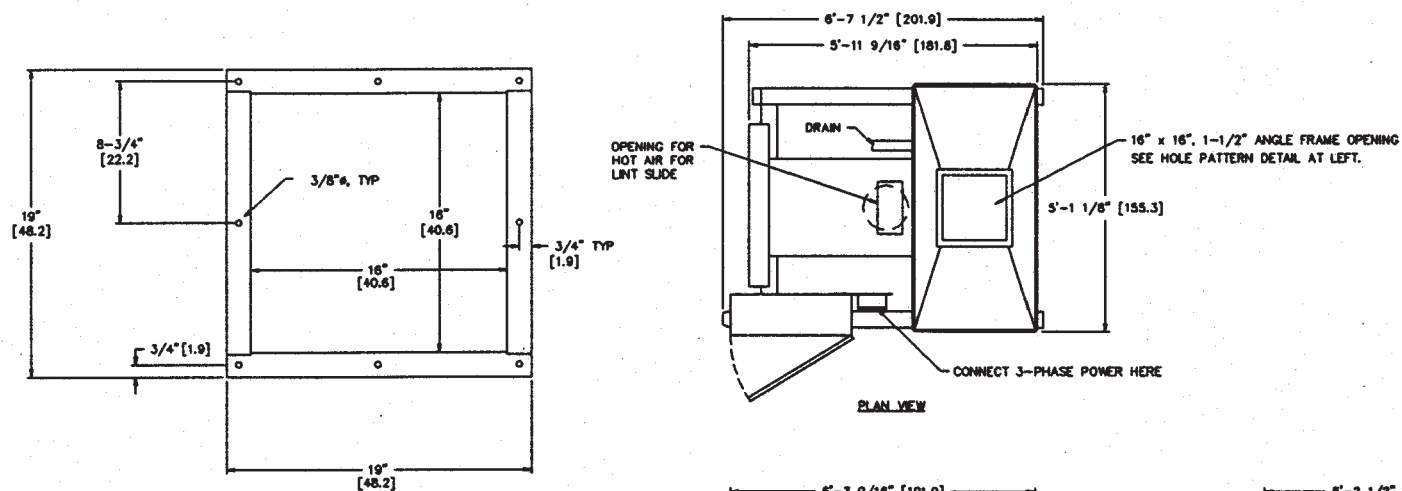
TOP VIEW

REF	QUANTITY	PART NO.	DESCRIPTION
2	1	13482	BURNER CONE (FOR NATURAL GAS; USE 12975B FOR LPG)
3	1	14620	BURNER BODY (FOR LPG; USE 18000 FOR GAS)
4	1	12985B	CONTOURED DISC
5	4	15724	5/16 X 1/2 HX HD SS CAP SCREW
6	1	15767	3/8 X 1 3/4 HX HD SS CAP SCREW
7	1	12398	SPARK PLUG, I-64-1
8	1	12399	FLAME ELECTRODE, FRS-2-6
9	1		BURNER ORIFICE DISC:

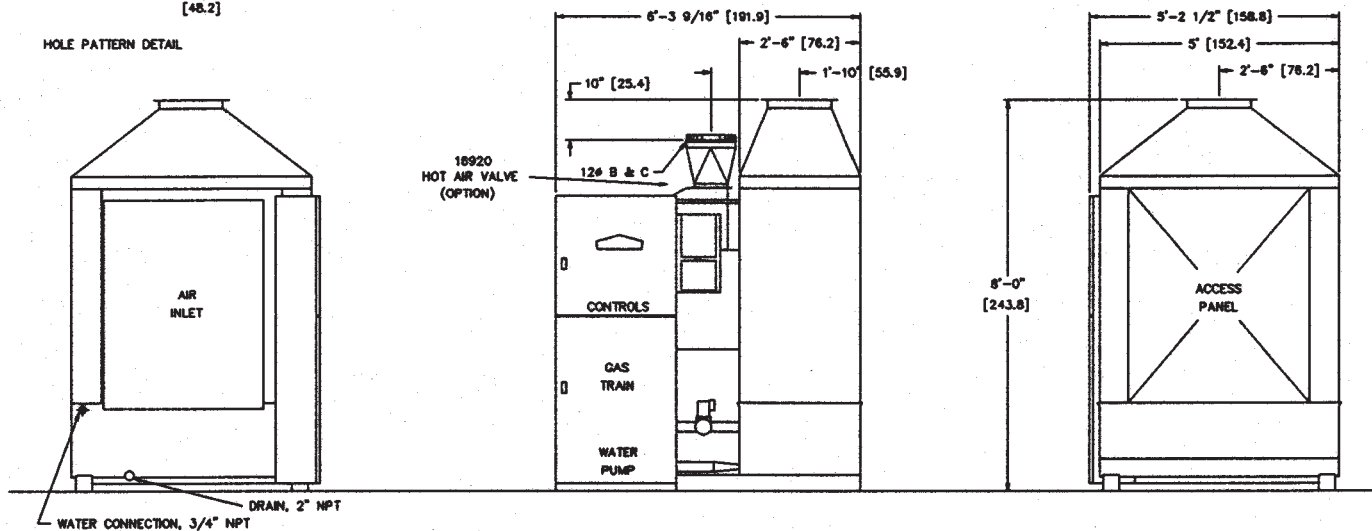
	SLOT	THICK	FLOW AREA
18031	.080	.048	15
18032	.114	.048	21
18033	.103	.075	30
18034	.149	.075	43
18035	.216	.075	63
18036	.179	.135	94
18037	.286	.135	149

PARTS NOT INCLUDED IN
13480 BURNER HEAD:

10	1	11159	SPARK PLUG WIRE
11	1	11158	FLAME ELECTRODE WIRE
12	1	15189	1 1/4 X 4 BLACK PIPE NIPPLE



HOLE PATTERN DETAIL



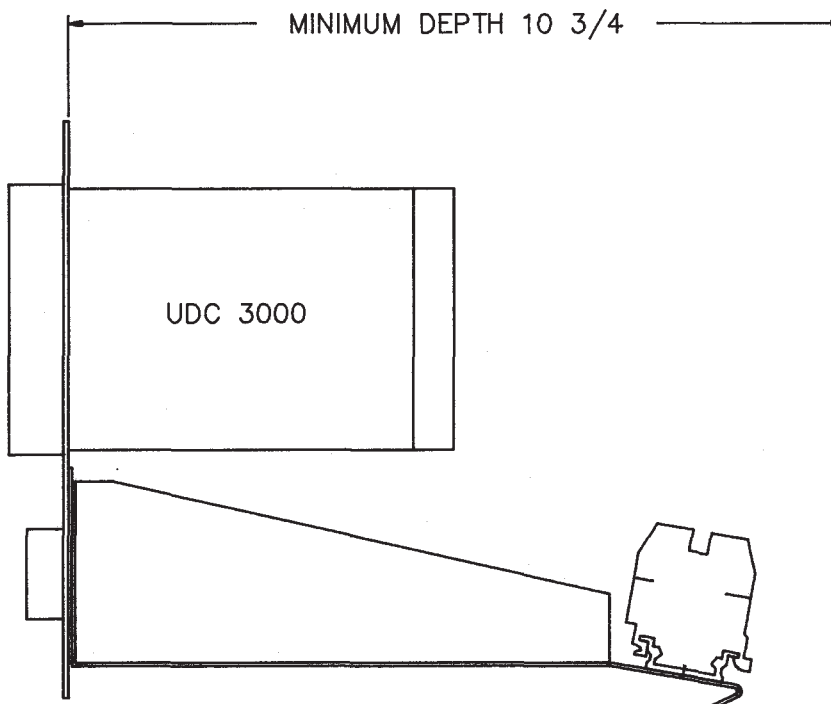
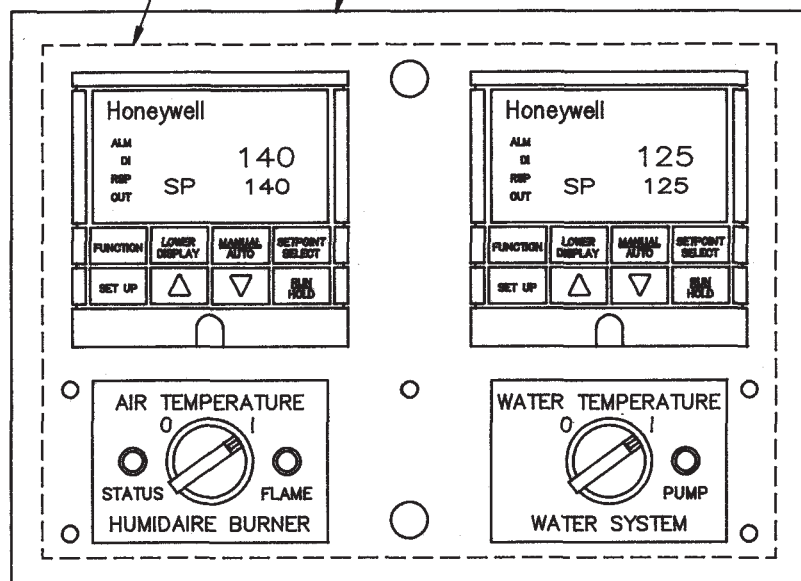
1/48 SCALE 1/4" = 1' 0"
DIMENSIONS IN FT- IN" [CENTIMETERS]

SAMUEL JACKSON MFG. CO.		
DIMENSION SHEET FOR	1-91	2113
HU-60-1106C		
GAS-FIRED HUMIDAIRE		
UNIT		

1-91

10 1/8 X 7 1/8 CUTOUT
REQUIRED FOR CONSOLE MOUNTING

FACE 11 WIDE X 8 HIGH

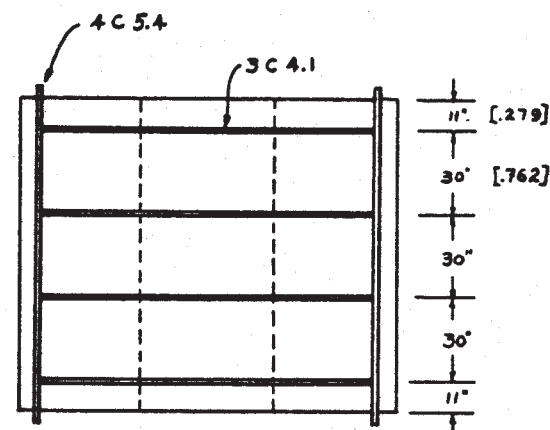
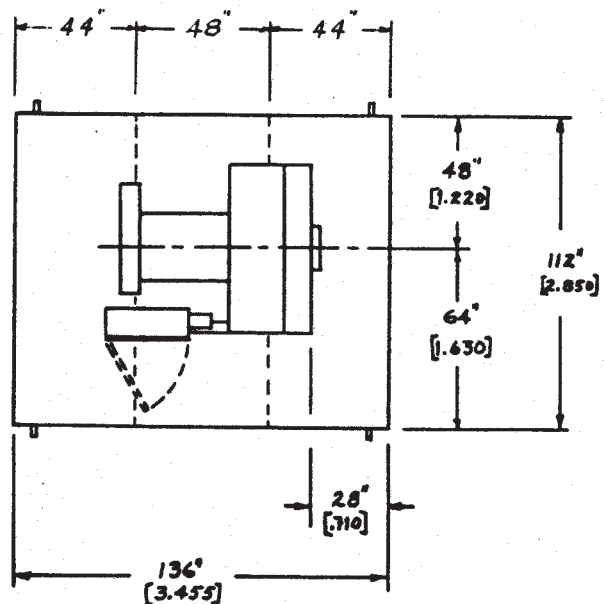


SAMUEL JACKSON, INC.

17040C HUMIDAIRE CONTROL
DIMENSION SHEET

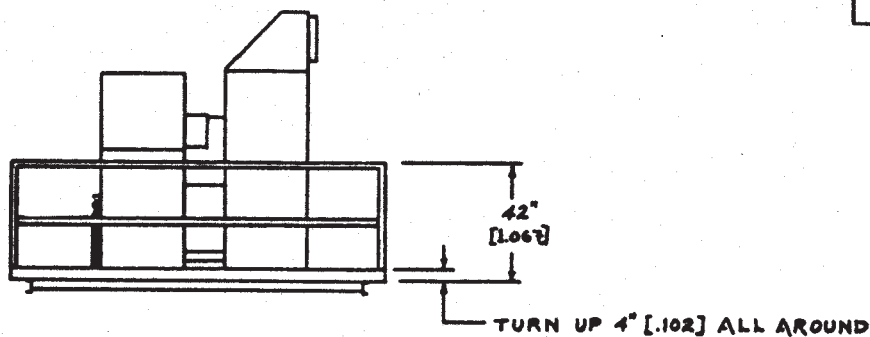
2361A
3-94

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	

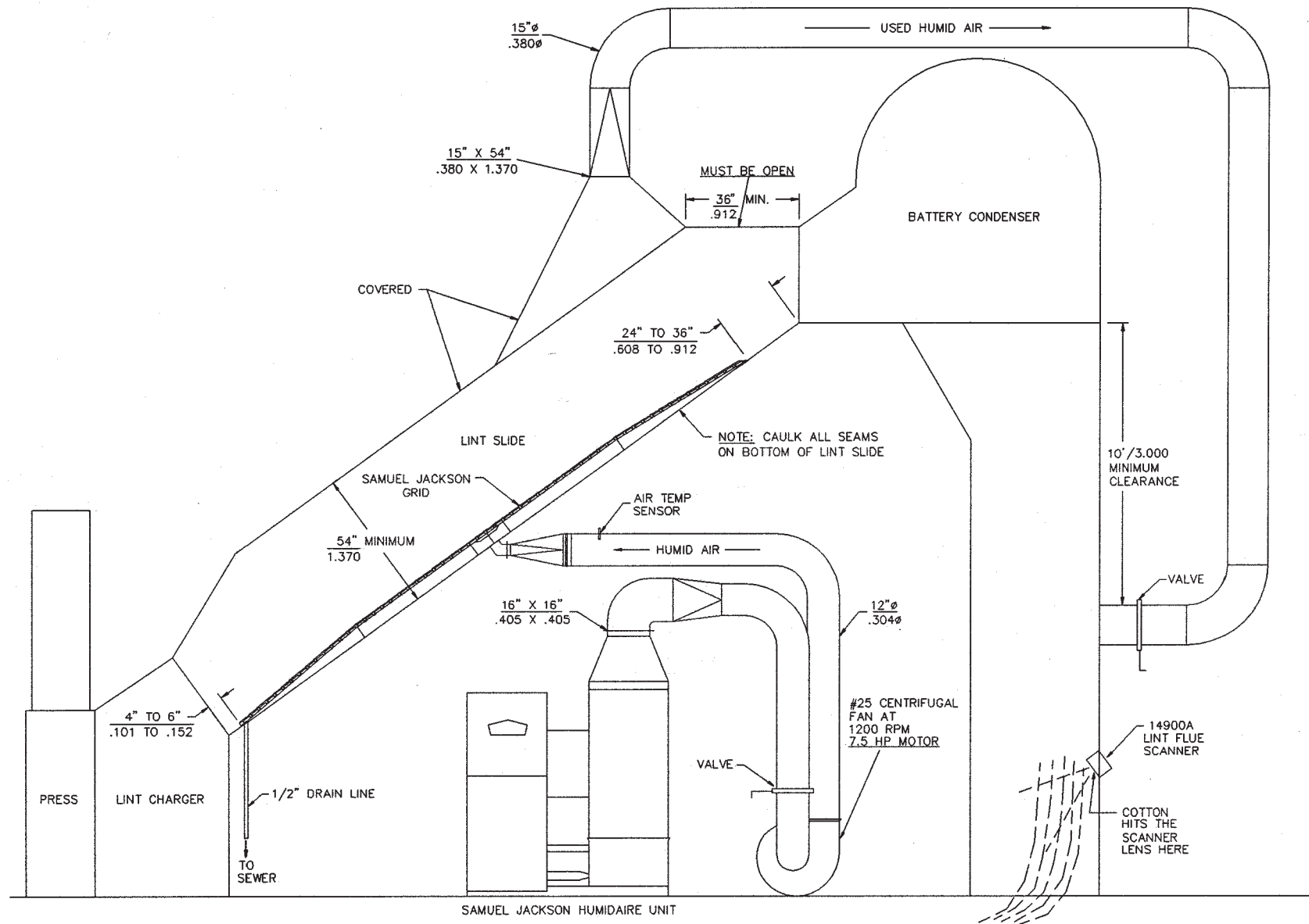


SAMUEL JACKSON MFG. CORP.

OVERHEAD PLATFORM
FOR
HU-60-1106C
HUMIDAIRE UNIT

DWN.
BY SGJ
DATE 4-28-78

DRAWING NO.
14-2290



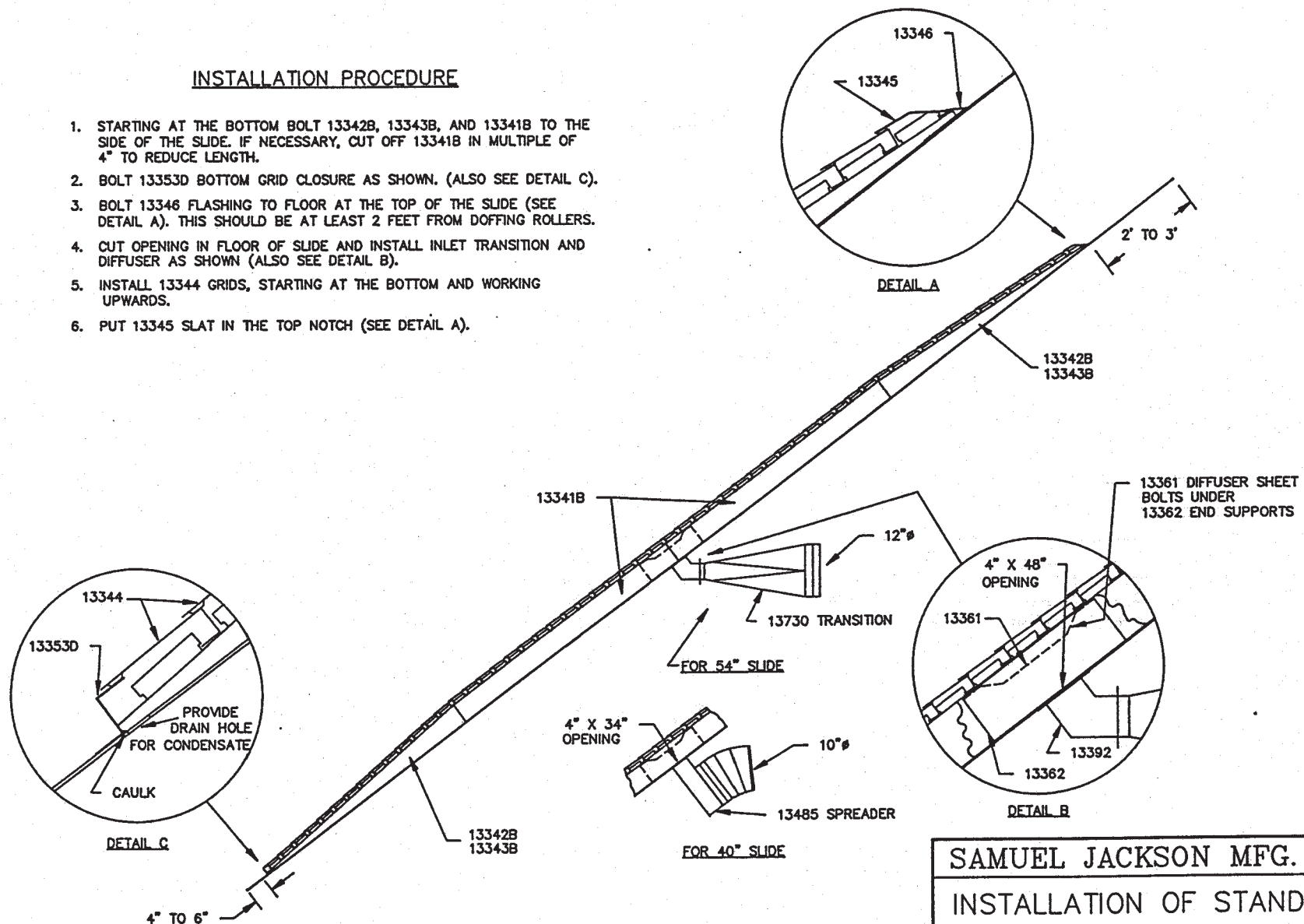
14-3230
11-93

STANDARD LINT SLIDE GRID INSTALLATION

SAMUEL JACKSON, INC.
LUBBOCK, TEXAS

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).



THE LINT SLIDE GRID IS COVERED BY U.S. PATENT 4,103,397

SAMUEL JACKSON MFG. CO.

INSTALLATION OF STANDARD
LINT SLIDE GRID ASSEMBLY

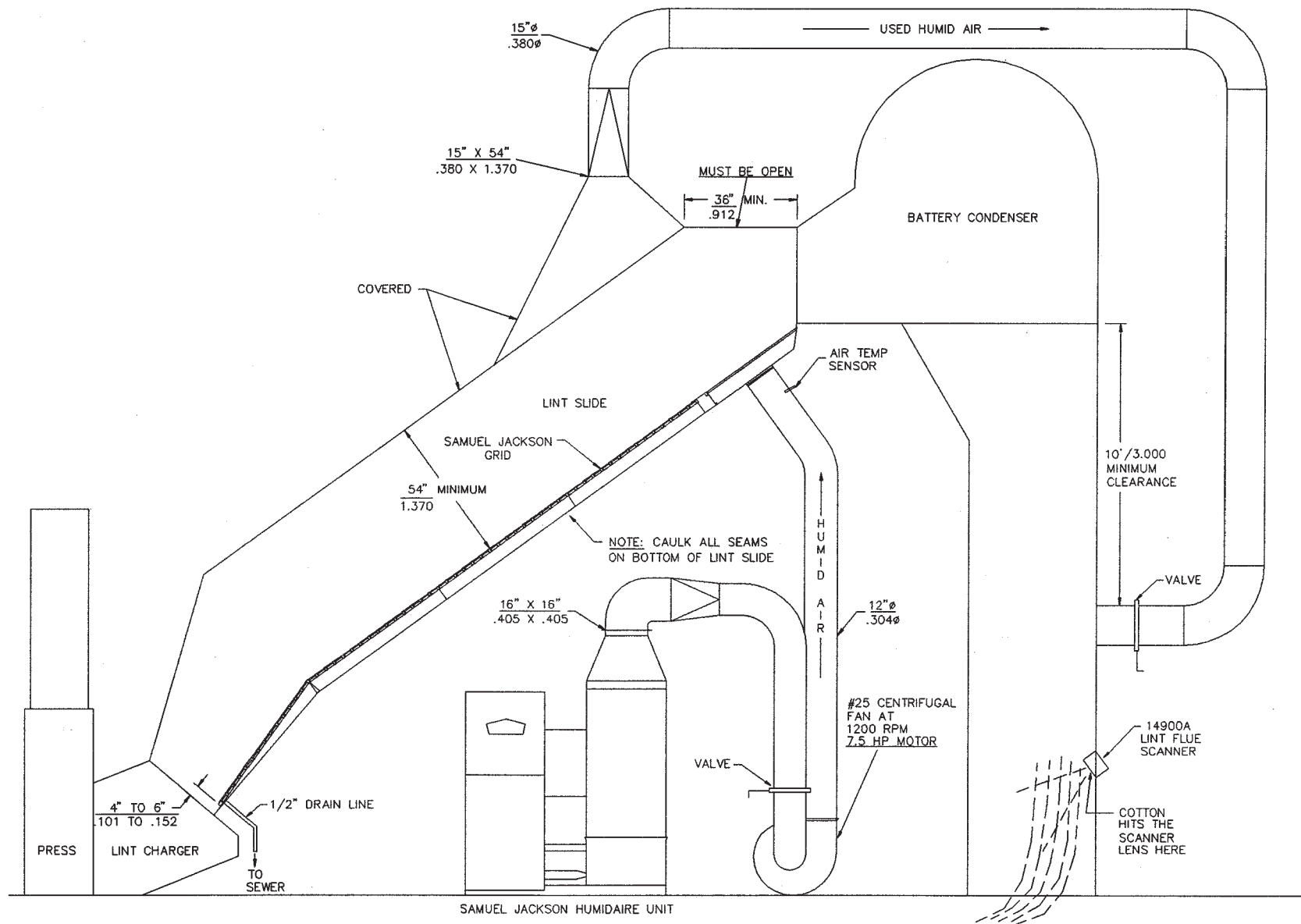
REF: LSG

DWN.
BY SK

DATE 6-29-89

DRAWING NO.

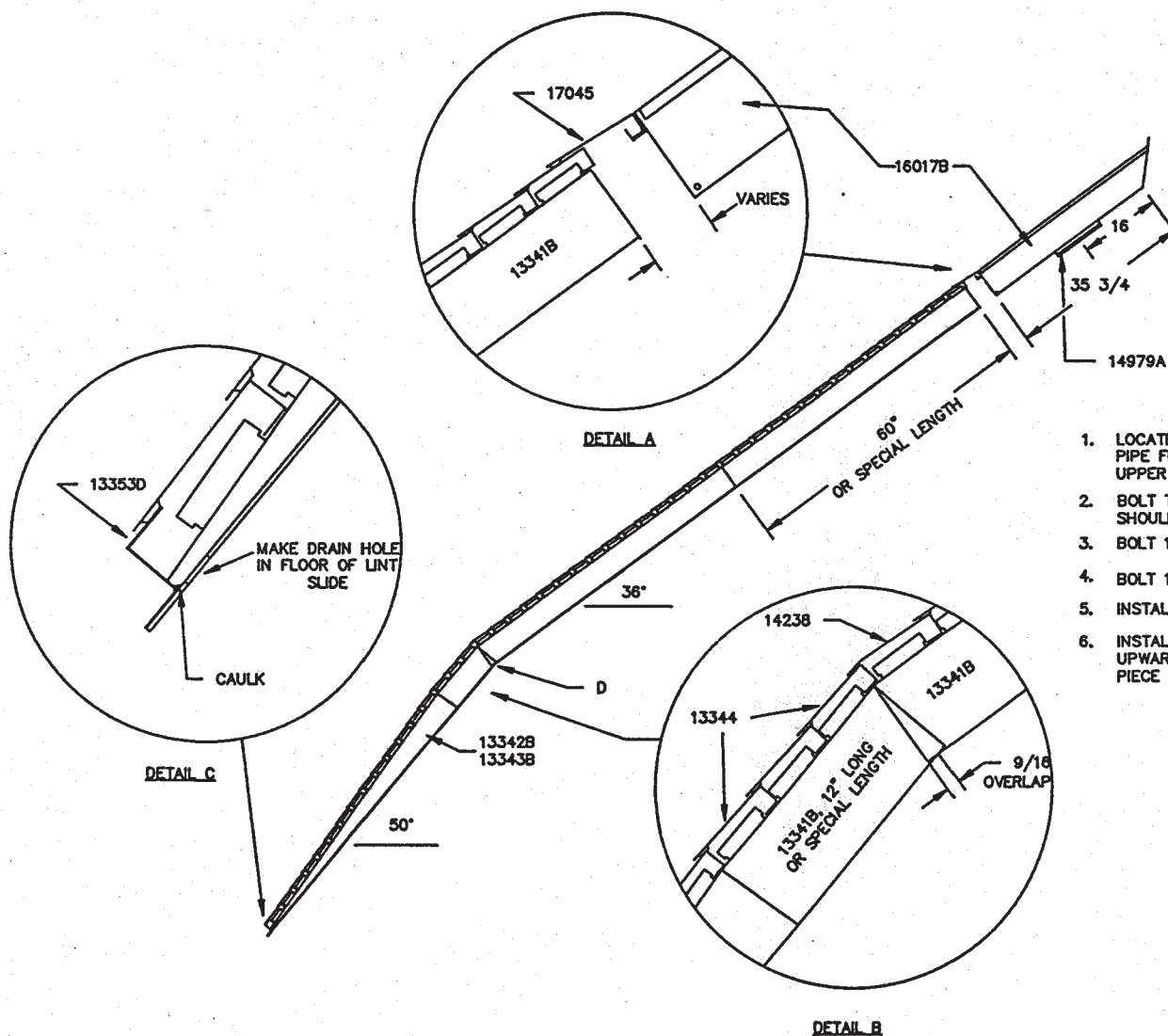
14-2558



14-3231
11-93

LUMMUS LINT SLIDE GRID INSTALLATION

SAMUEL JACKSON, INC.
LUBBOCK, TEXAS



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

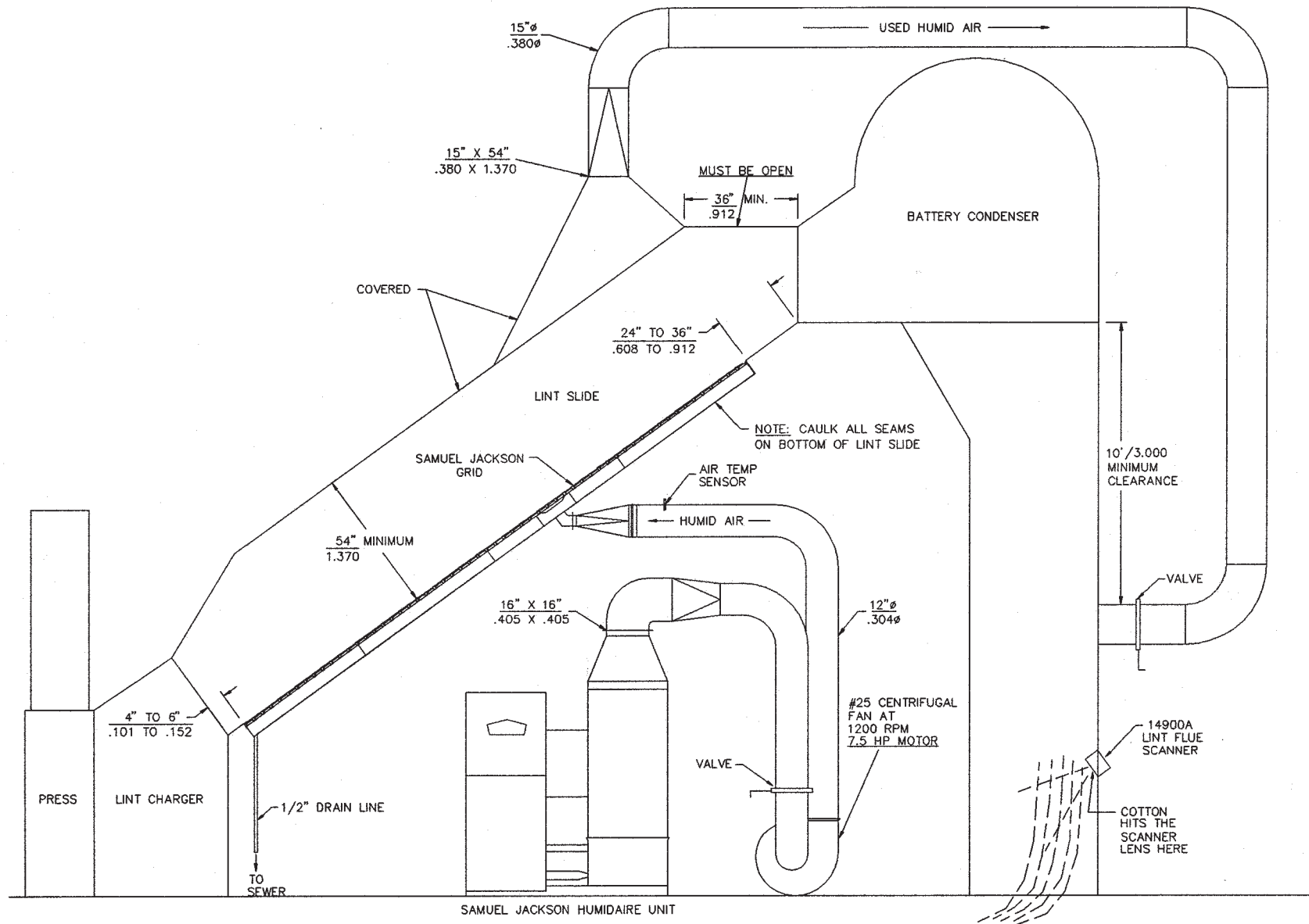
DWN.
BY SK

DATE 6-29-89

DRAWING NO.

14-2453

THE LINT SLIDE GRID IS COVERED BY U.S. PATENT 4,103,397



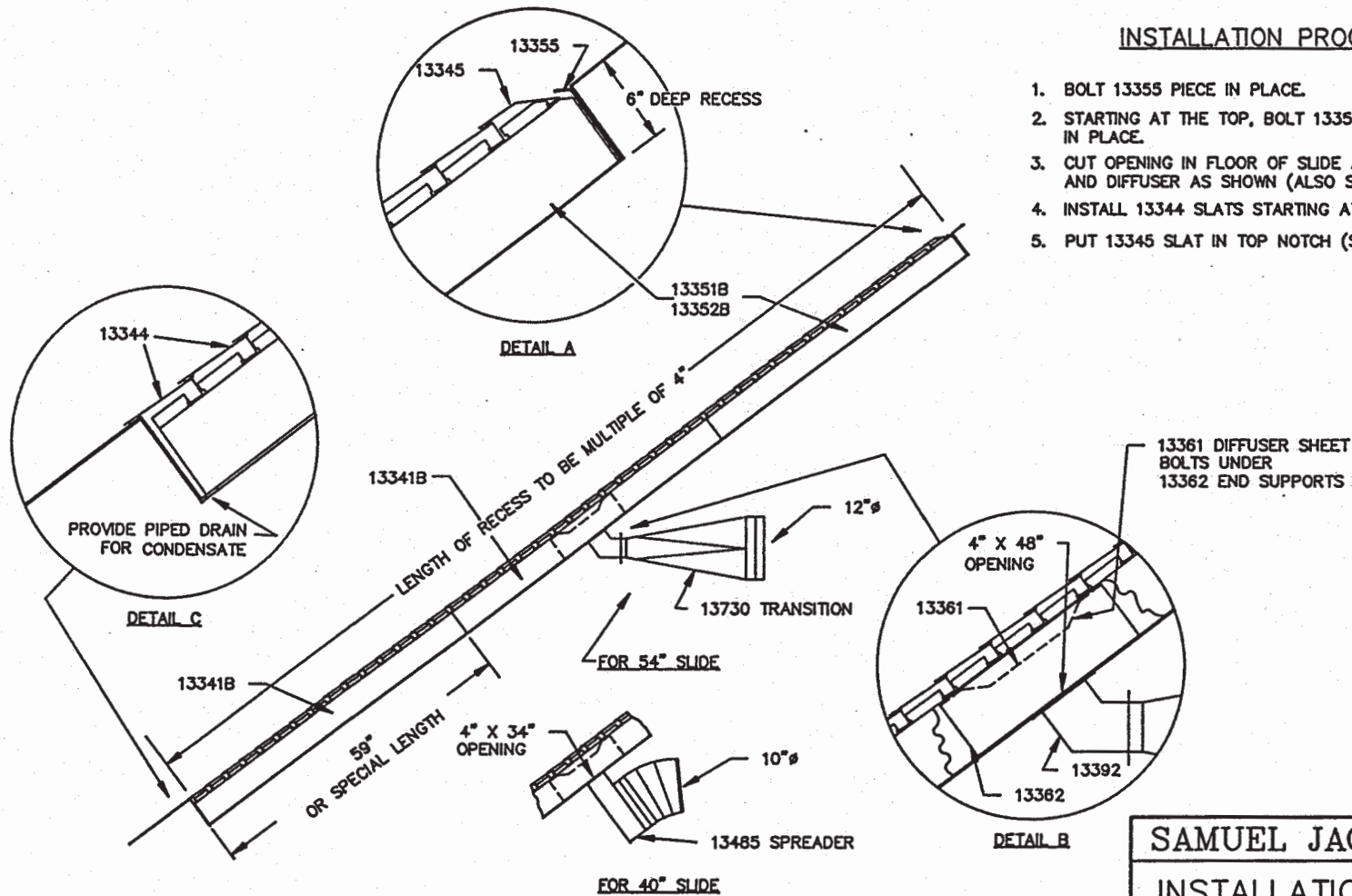
14-3232
11-93

RECESSED LINT SLIDE GRID INSTALLATION

SAMUEL JACKSON, INC.
LUBBOCK, TEXAS

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).



THE LINT SLIDE GRID IS COVERED BY U.S. PATENT 4,103,397

SAMUEL JACKSON MFG. CO.

INSTALLATION OF RECESSED
LINT SLIDE GRID ASSEMBLY
REF: LSG

DWN.
BY SK

DRAWING NO.

DATE 6-28-89

14-2557

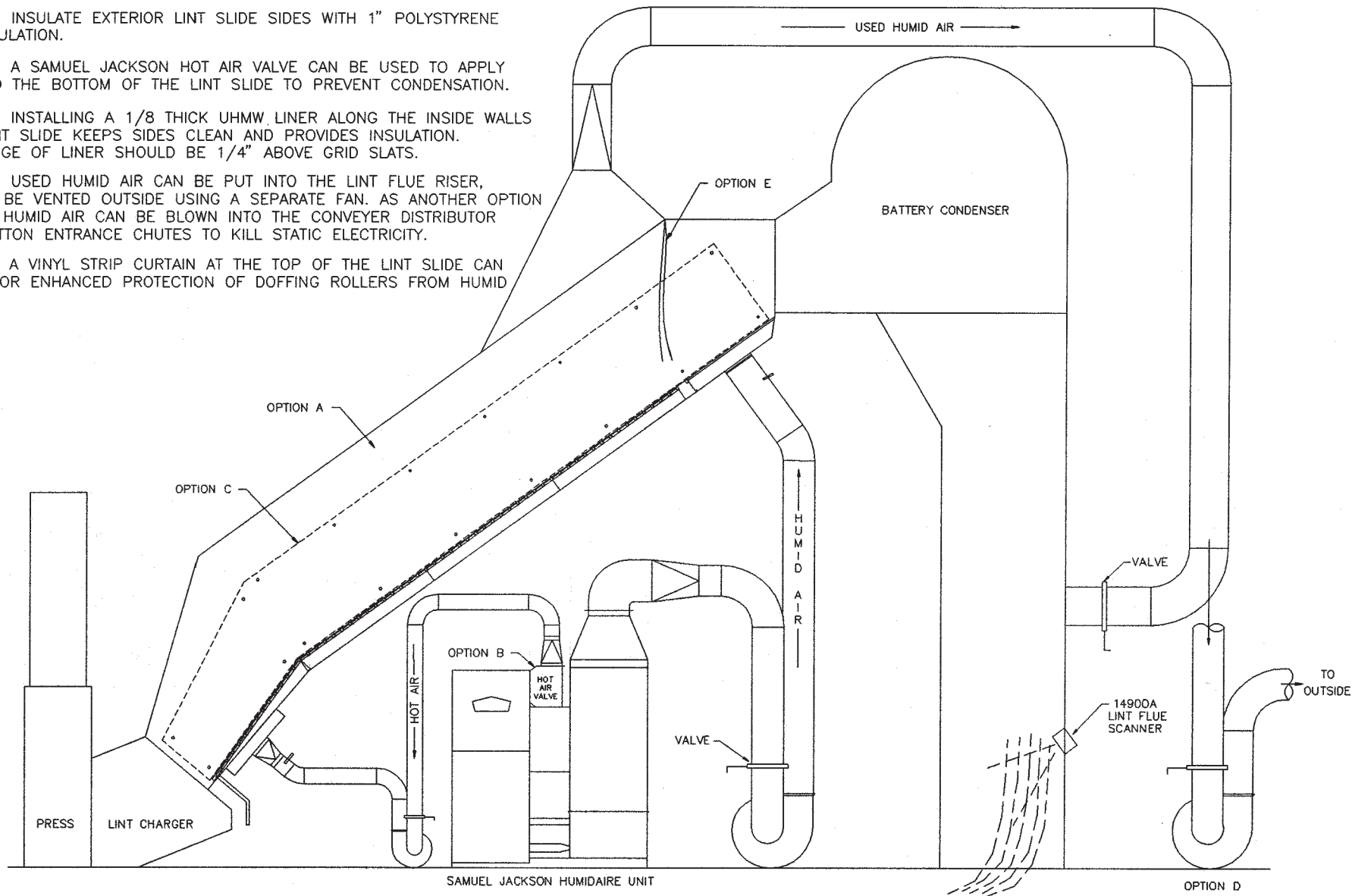
OPTION A. INSULATE EXTERIOR LINT SLIDE SIDES WITH 1" POLYSTYRENE BOARD INSULATION.

OPTION B. A SAMUEL JACKSON HOT AIR VALVE CAN BE USED TO APPLY HOT AIR TO THE BOTTOM OF THE LINT SLIDE TO PREVENT CONDENSATION.

OPTION C. INSTALLING A 1/8 THICK UHMW LINER ALONG THE INSIDE WALLS OF THE LINT SLIDE KEEPS SIDES CLEAN AND PROVIDES INSULATION. BOTTOM EDGE OF LINER SHOULD BE 1/4" ABOVE GRID SLATS.

OPTION D. USED HUMID AIR CAN BE PUT INTO THE LINT FLUE RISER, OR IT CAN BE VENTED OUTSIDE USING A SEPARATE FAN. AS ANOTHER OPTION THIS USED HUMID AIR CAN BE BLOWN INTO THE CONVEYER DISTRIBUTOR AT THE COTTON ENTRANCE CHUTES TO KILL STATIC ELECTRICITY.

OPTION E. A VINYL STRIP CURTAIN AT THE TOP OF THE LINT SLIDE CAN BE USED FOR ENHANCED PROTECTION OF DOFFING ROLLERS FROM HUMID AIR.



14-3233
11-93

LINT SLIDE GRID OPTIONS AND ENHANCEMENTS

SAMUEL JACKSON, INC.
LUBBOCK, TEXAS