

OWNER'S MANUAL

MODEL DH5-3 & DH5-3B – HEATED HOLDING UNIT



DH5-3 Shown

Supplier Name: **MARSHALL AIR SYSTEMS, INC.**
Address: 419 Peachtree Drive South
Charlotte, NC 28217
Serial #'s: _____

Date Received: _____
Date Installed: _____
Telephone #: 704-525-6230
Fax #: 704-525-6229
Service Referral #: 800-722-3474
Local Service Name: _____
Local Service #: _____

PRODUCT DESCRIPTION

This Heated Holding Unit features Marshall's own ThermoGlo™ heating technology. Heat radiates from every square inch of the upper and lower flat plate heating surfaces. This eliminates the need to clean intricate calrod, wire and reflector assemblies.

The DH5-3 and the DH5-3B Heated Holding Units accommodate up to three 1/3 size pans 2 1/2" deep, two 1/2 sheet pans, one full pan or one 1/2 sheet pan.

The unit is controlled by an integrated time/temperature controller located on the front of the heated holding cabinet. The control determines the intensity of top and bottom heaters. The integrated time/temperature controller also features 3 independent countdown timers to help maintain product integrity. An On/Off switch is easily accessible to the store personnel allowing them to turn on and off the unit. The Heated Holding Unit offers the latest in technological design which gives you the most favorable holding characteristics in a system that is simple to work with and operate.

GENERAL SPECIFICATIONS

Model: DH5-3 / DH5-3B
Height: 9.125"
Width: 22.375"
Depth: 14.500"
Electrical: 120V - 4.3A
Weight: 40 lbs
Approvals: NSF/ETL

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS OR LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

WARNING: IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH. READ THE INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING OR SERVICING THIS EQUIPMENT.

KEEP THIS MANUAL IN A SAFE PLACE AND RETAIN FOR FUTURE USE.



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SCHEMATICS

WIRING SCHEMATIC, DH5 SERIES 120V 4.3-17.2A 160458

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PRE-INSTALLATION

1. The Heated Holding Unit is packaged to minimize the risk of shipping damage. Immediately upon receipt, make certain to inspect the unit for damage. **FILE ALL CLAIMS WITH THE FREIGHT CARRIER.**
2. Unpack and inspect the unit. **IF ANY CONCEALED DAMAGE, FILE ALL CLAIMS WITH THE FREIGHT CARRIER.**

FINAL INSTALLATION

1. Unpack unit and remove all protective paper or plastic covering from metal parts.
2. Place holding unit on stable base.
3. Plug unit into 120v receptacle rated for 20 amps.

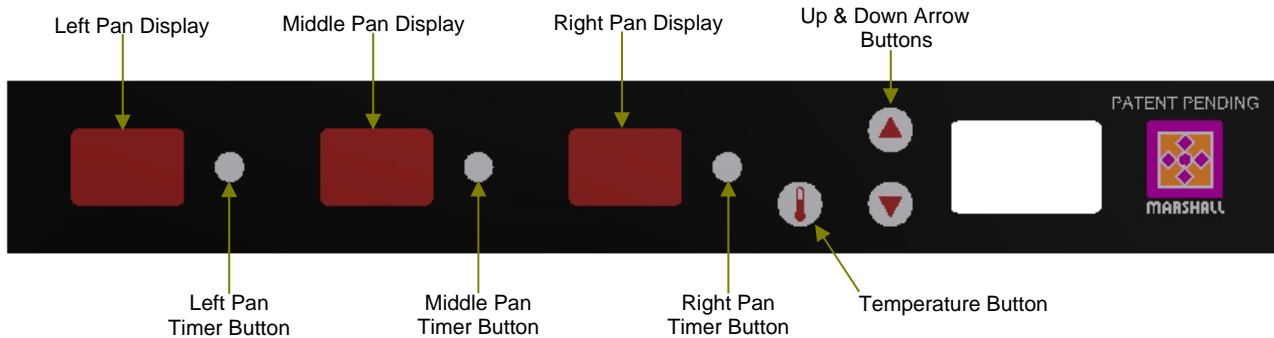
TO USE THE HOLDING UNIT

1. Turn on the power switch. The unit is ready to use after a 30 minute preheat period.
2. The unit is factory set for a temperature of 250°F for both upper and bottom heaters. The factory set hold time is 45 minutes with the alert happening at the 40:30 minute time. If a new setting is required, follow the instructions in Figure 3 to adjust the settings. **DO NOT SET THE TEMPERATURE HIGHER THAN 290° F. DOING SO WILL CAUSE DAMAGE TO THE UNIT.**
3. The unit can hold up to three 1/3 size pans 2 1/2" deep, two 1/2 sheet pans, one full pan or one 1/2 sheet pan per deck. Each controller display correspond to a 1/3 size pan. Place a product pan in one of the 3 possible positions and press the associated timer button (see User Interface below) to begin timer.
4. The corresponding display will then show the remaining holding time. Once the corresponding holding time reaches 40:30 minutes of hold time it will sound a warning alert.
5. Once the corresponding holding time reaches the final minute, the display will change from minutes to seconds.
6. Once the corresponding holding time reaches 0, a warning alert will sound. Press and release the corresponding pan timer button to stop.
7. Any timer can be stopped at any time during the holding period, by pressing and holding the pan timer button for 2.5 seconds.

TIMER/TEMPERATURE CONTROLLER OPERATION



The following is the user interface layout:



TIMER FUNCTIONS

The factory set hold time is 45 minutes with the alert happening at the 40:30 minute time (10% of holding time). If a new setting is required, follow the instructions in Figure 3 to adjust the settings.

TIMER DISPLAY

"PrE" "hEt" The holding unit has not reached ready mode for holding (factory set for 30 minutes).

"----" Holding unit has reached ready mode for holding but timers not active.

"42" Timer active, hold time remaining (flashes last 10% of the holding period with an audible alert at the start of the last 10%).

"000" Holding period has elapsed. Product to be discarded (flashes with audible alert).

DISPLAY TEMPERATURE

The unit has two heaters, top and bottom. Press the temperature button to display the upper heater temperature. The left display will show "uP" for the upper heater while the right display shows the temperature. Press the temperature button again to display the lower heater temperature. The left display will show "Lo" for the lower heater while the right display shows the temperature. Press and hold the temperature button to exit to previous state.

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ADJUSTING TEMPERATURE, HOLDING PERIOD OR PRE-ALARM %

The unit is factory set, however, if a new setting is required; follow the instructions in Figure 3 to adjust the settings. **DO NOT SET THE TEMPERATURE HIGHER THAN 290°F. DOING SO WILL CAUSE DAMAGE TO THE UNIT.**

DAILY MAINTENANCE

1. Turn off the unit and allow it to cool for 20 minutes.
2. Pans and/or pan covers should be removed, washed in mild multi-purpose detergent, rinsed and sanitized.
3. Clean unit and base with a damp cloth and non-abrasive cleaner. **DO NOT IMMERSE UNIT IN WATER! DO NOT USE CAUSTIC CLEANING SOLUTIONS!**
4. Allow sufficient drying time before attempting to use.

MONTHLY MAINTENANCE

1. Follow the daily schedule; there are no adjustments.
2. Inspect condition of cord/plug. If damaged, have it replaced.
3. Inspect the condition of the control overlay. If damaged, have it replaced.

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TROUBLESHOOTING CHART

** DISASSEMBLING HEATER VOIDS WARRANTY **

Identify problem in the left column and look for a possible cause in the middle column and the solution in right hand column. Probable causes listed in the order they are most likely to happen. This sequence should be used to isolate the problem.

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. NO HEAT	A. UNPLUGGED B. CIRCUIT BREAKER IS TRIPPED C. CORD DEFECTIVE D. CONTROLLER "OFF" E. DEFECTIVE SOLID STATE RELAY	A. PLUG IN B. RESET BREAKER - CALL AN ELECTRICIAN IF TRIPPED TWICE C. REPLACE DEFECTIVE CORD D. TURN CONTROLLER "ON" E. REPLACE DEFECTIVE SOLID STATE RELAY
2. LOW PRODUCT TEMPERATURE	A. TEMPERATURE SET TOO LOW B. EXCESSIVE AIR DRAFT(S)	A. ADJUST TO HIGHER SETTING B. SHIELD DRAFT(S) OR MOVE UNIT
3. ERROR CODE: "OPN" "UP" OR "LO"	A. OPEN SENSOR EITHER UPPER "UP" OR LOWER "LO" B. LOOSE SENSOR CONNECTION	A. REPLACE SENSOR** B. SECURE SENSOR CONNECTION
4. ERROR CODE: "SHT" "UP" OR "LO"	A. SENSOR FAILED "SHORT"	A. REPLACE SENSOR**

*SEE 'DISPLAY TEMPERATURE' FOR ZONE LOCATIONS

****NOTE:** When replacing sensor, a special heat sink sealant will be present when removing failed sensor. Applying new sealant is not required; however, be sure to utilize existing sealant when mounting new sensor.

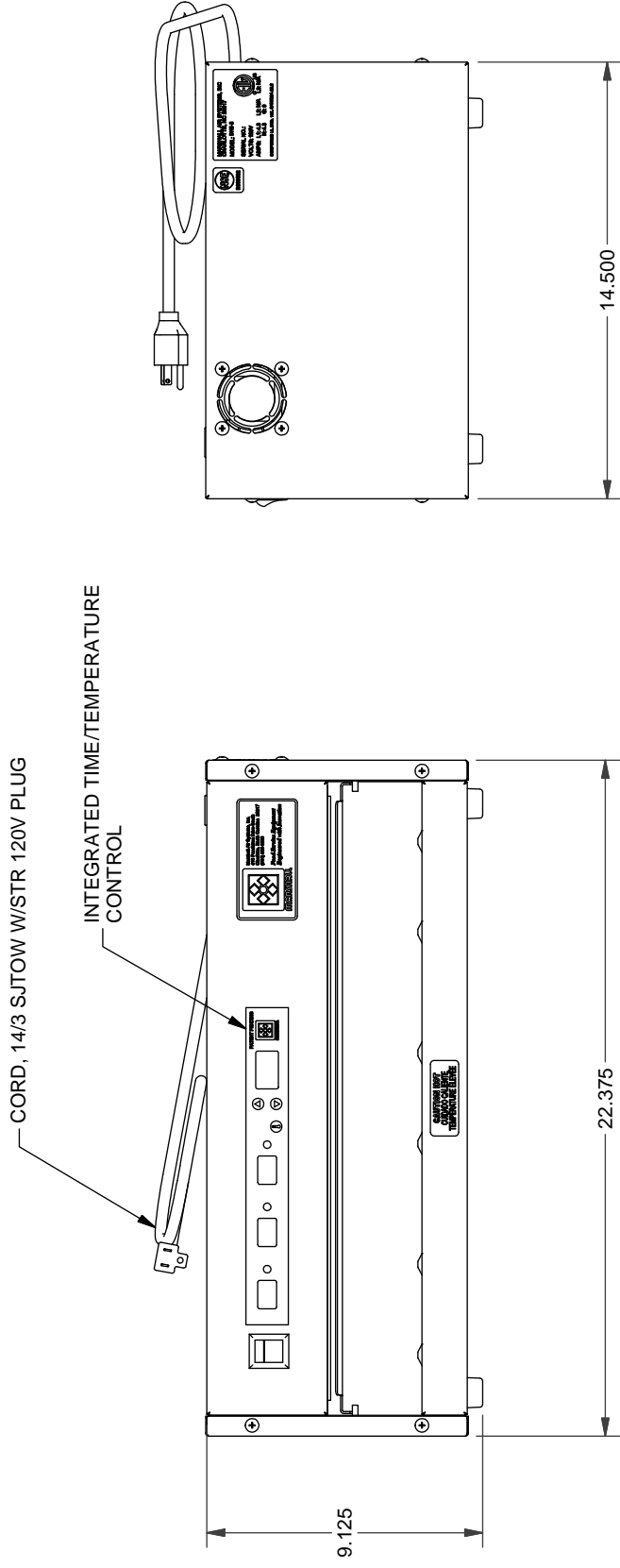
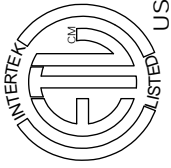
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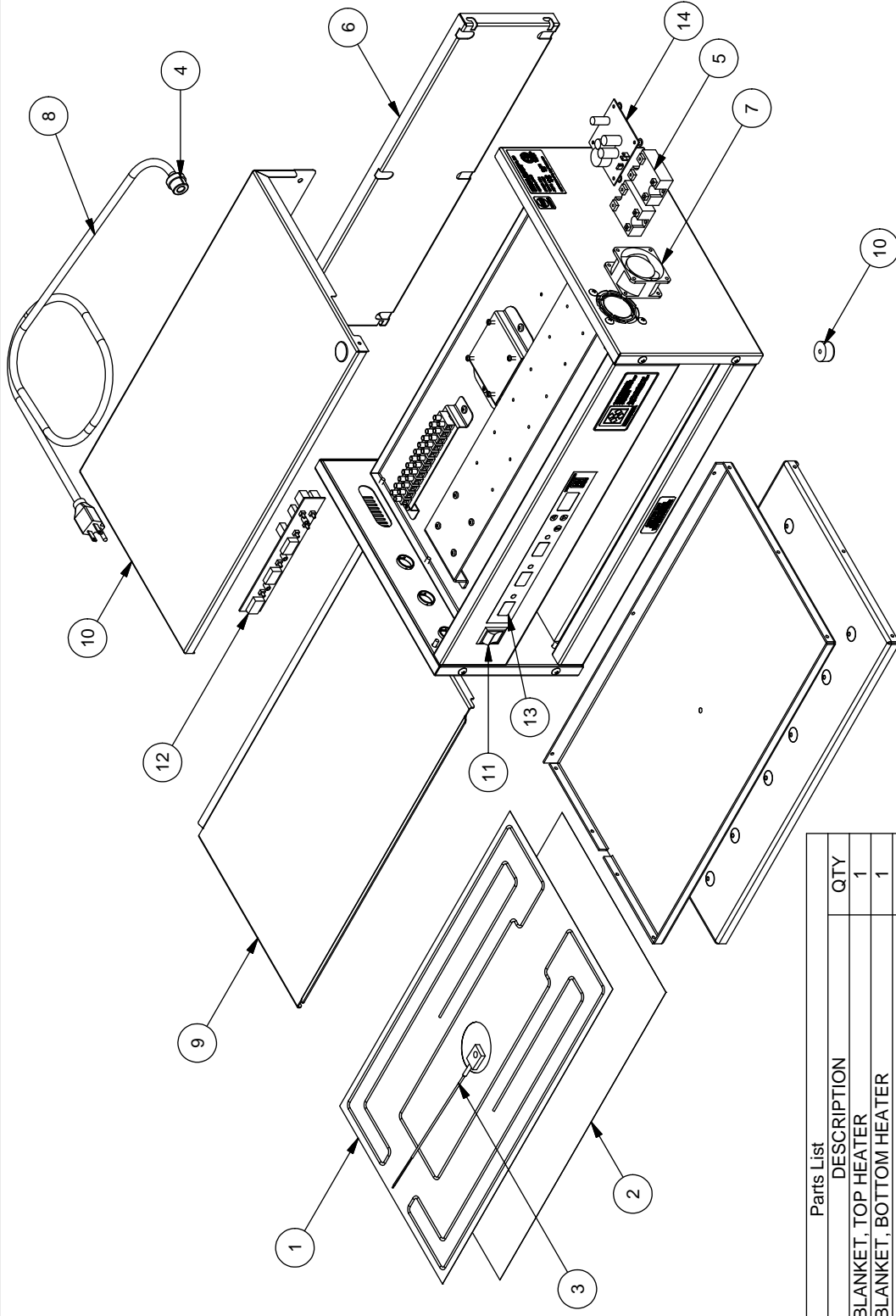
REPLACEMENT PARTS

PART #	DESCRIPTION	QTY PER UNIT	LOCATION
504289	Blanket, Top Heater	1	Figure 2
504293	Blanket, Bottom Heater	1	Figure 2
502064	Sensor, RTD, 48"	2	Figure 2 Schematic
502080	Connector, Strain Relief	1	Figure 2
504023	Relay, Solid State 25A	2	Figure 2, Schematic
158678	Panel, Rear Cover	1	Figure 2
501873	Fan, Cooling, Boxer, 115VAC	1	Figure 2 Schematic
502075	Cord, 14/3 SJTOW W/STR 120V Plug	1	Figure 2 Schematic
160294	Cover, 2.5" Pan (DH5-3)	1	Figure 2
501867	Foot, Blk Rubber	4	Figure 2
502425	Switch, Curvette, Double Pole	1	Figure 2, Schematic
160459	Control, Integrated Time/Temp DH5-3 & DH5-3B	1	Figure 2, Schematic
160459	Overlay, Controller	1	Figure 2
504318	Power Supply	1	Figure 2 Schematic



OVERALL DIMENSIONS DH5-3 & DH5-3B

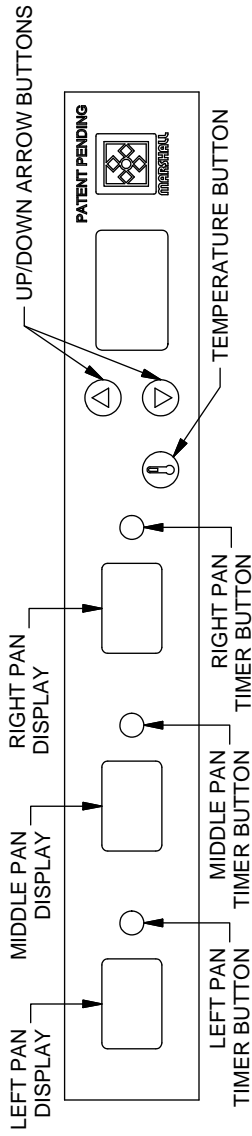
FIGURE 1



REPLACEMENT PARTS DH5-3 & DH5-3B

FIGURE 2

Parts List			
ITEM	PART NO.	DESCRIPTION	QTY
1	504289	BLANKET, TOP HEATER	1
2	504293	BLANKET, BOTTOM HEATER	1
3	502064	SENSOR, RTD, 48"	2
4	502080	CONNECTOR, STRAIN RELIEF	1
5	504023	RELAY, SOLID STATE 25A	2
6	158678	PANEL, REAR COVER	1
7	501873	FAN, COOLING, BOXER, 115VAC	1
8	502075	CORD, 14/3 SJTOW W/STR 120V PLUG	1
9	160294	COVER, 2.5" PAN	1
10	501867	FOOT, BLK RUBBER	4
11	502425	SWITCH, CURVETTE, DOUBLE POLE	1
12	160459	CONTROL, INTEGRATED TIME/TEMP	1
13	160284	OVERLAY, CONTROLLER	1
14	504318	POWER SUPPLY	1



WARNING: ALL CHANGES ARE SAVED AS THEY HAPPEN! WRITE DOWN ALL VALUES BEFORE MAKING ANY CHANGES IN CASE A WRONG VALUE IS CHANGED.

TO ADJUST HOLDING TIMES (FACTORY SET FOR 30 MINUTES):

1. PRESS AND HOLD FOR APPROXIMATELY 2 SECONDS THE TIMER BUTTON FOR THE PAN THAT NEEDS CHANGING.
2. THE DISPLAY WILL FLASH THE CURRENT SETTING FOR THAT PAN.
3. PRESS AND HOLD THE UP OR DOWN ARROW BUTTON TO CONTINUOUSLY CHANGE VALUE. PRESS AND RELEASE TO CHANGE BY INCREMENTS OF 1.
4. PRESS AND HOLD THE TIMER BUTTON FOR APPROXIMATELY 2 SECONDS TO SAVE AND EXIT TO PREVIOUS STATE.

PROGRAMMING MODE:

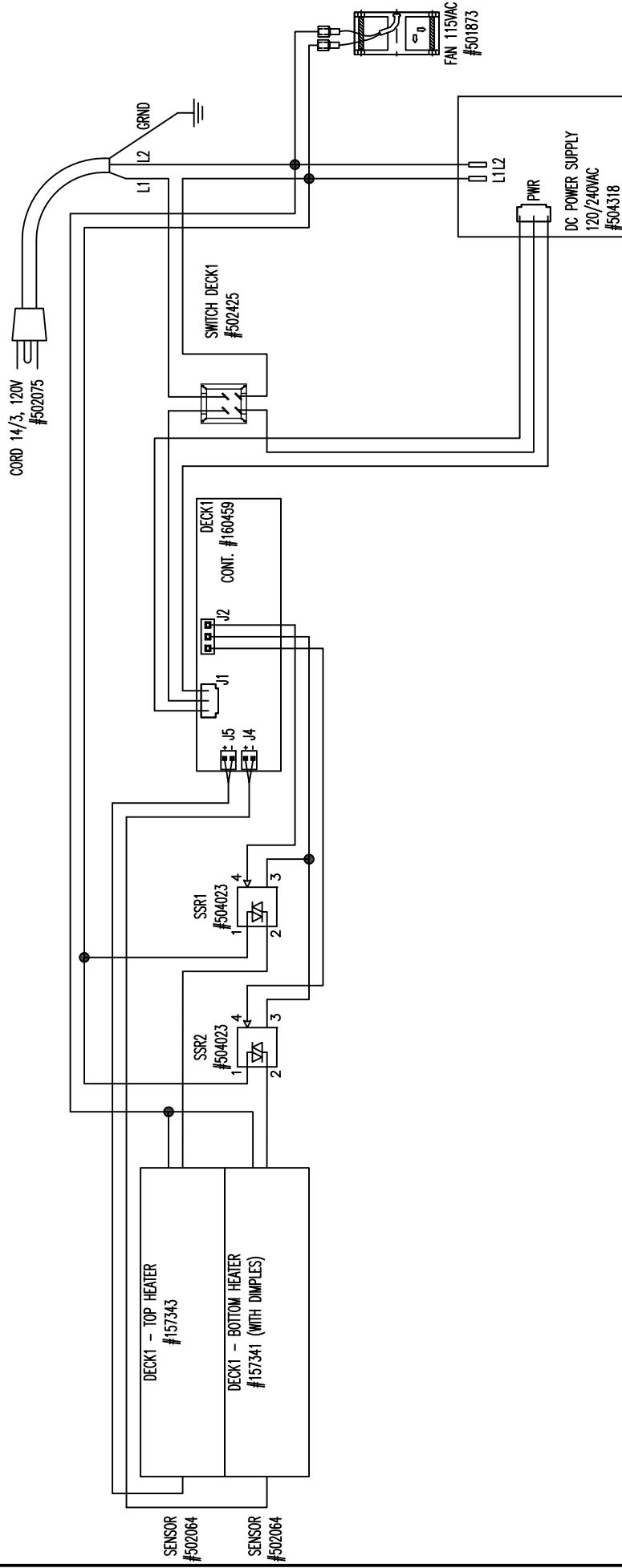
TO ACCESS PROGRAMMABLE PARAMETERS, PRESS AND HOLD FOR APPROXIMATELY 2 SECONDS THE UP AND DOWN ARROW BUTTONS. USE TEMPERATURE BUTTON TO CYCLE THROUGH PARAMETERS. TO CHANGE SETTING BY INCREMENTS OF 1, PRESS ONCE UP OR DOWN ARROW BUTTON. PRESS AND HOLD UP OR DOWN ARROW BUTTON FOR CONTINUOUS INCREMENTATION. PRESS AND HOLD THE TEMPERATURE BUTTON AT ANY TIME TO SAVE AND EXIT TO PREVIOUS STATE.

- 1) **TEMPERATURE UNITS (FACTORY SET TO "F"):** RIGHT DISPLAY WILL SHOW "F" FOR FAHRENHEIT. USE UP OR DOWN ARROW BUTTON TO CHANGE TO "C" FOR CELSIUS.
- 2) **PRE-ALERT TIME (FACTORY SET TO 10):** THIS REPRESENT THE PERCENTAGE OF THE HOLDING TIME THAT THE PRE-ALERT BEEPING OCCURS (E.G. IF HOLDING TIME IS 30 MINUTES, PRE-ALERT BEEPING WILL OCCUR WHEN TIMER IS DOWN TO 3 MINUTES, 10% OF 30 MINUTES). LEFT DISPLAY WILL SHOW "Al" FOR PRE-ALERT AND RIGHT DISPLAY WILL SHOW THE CURRENT VALUE. USE UP OR DOWN ARROW BUTTONS TO CHANGE TO NEW SETTING.
- 3) **TOP TEMPERATURE SET POINT (FACTORY SET TO 250°F):** THE LEFT DISPLAY WILL SHOW "top" FOR TOP HEATER AND THE RIGHT DISPLAY WILL SHOW THE CURRENT SETTING. USE UP OR DOWN ARROW BUTTONS TO CHANGE TO NEW SETTING.
- 4) **BOTTOM TEMPERATURE SET POINT (FACTORY SET TO 250°F):** THE LEFT DISPLAY WILL SHOW "bot" FOR BOTTOM HEATER AND THE RIGHT DISPLAY WILL SHOW THE CURRENT SETTING. USE UP OR DOWN ARROW BUTTONS TO CHANGE TO NEW SETTING.
- 5) **DISPLAY MODE (FACTORY SET TO TIME DISPLAY MODE):** THE LEFT DISPLAY WILL SHOW "gSP" FOR DISPLAY AND THE RIGHT DISPLAY WILL SHOW THE CURRENT SETTING. USE UP OR DOWN ARROW BUTTONS TO SELECT ONE OF THE SIX AVAILABLE MODES:
 - "123" FOR TIME DISPLAY MODE. ALL TIMERS ARE INDEPENDENT OF EACH OTHERS AND REMAINING HOLD TIME IS INDICATED IN MINUTES.
 - "rdy" FOR TEXT DISPLAY MODE. ALL TIMERS ARE INDEPENDENT OF EACH OTHERS AND ARE DISPLAYED AS TEXT MESSAGES. "hLd" FOR HOLD INDICATES THAT THE PRODUCT IS TO BE USED AND "oLd" FOR OLD STATES THAT THE PRODUCT NEEDS TO BE DISCARD.
 - "Lnc" FOR LINK MODE: IN THIS CONFIGURATION, THE TWO DISPLAYS ARE LINKED TOGETHER ALLOWING THE TRAYS OF PRODUCT TO BE SERVED IN THE ORDER THEY WERE INSERTED ON THE SHELF. "rdy" MEANS THAT THE PRODUCT IS THE ONE BEING USED, "hLd" MEANS THAT THE PRODUCT IS NEXT IN LINE AND "oLd" MEANS THAT THE PRODUCT IS TO BE DISCARD.
 - "Lc" FOR TIME LINK MODE: SAME AS "Lnc" LINK MODE BUT THE DISPLAY ASSOCIATED TO THE PRODUCT TO BE USED WILL SHOW THE REMAINING TIME INSTEAD OF "rdy".
 - "Lct" FOR LINK TRANSFER MODE: IN THIS MODE, THE SERVICE PAN (PAN TO BE USED) WILL ALWAYS BE TRANSFERRED TO THE LEFT DISPLAY OR RIGHT DISPLAY DEPENDING ON THE TRANSFER DIRECTION SUB-PARAMETER SETTING. FOR EXAMPLE, IF THE TRANSFER DIRECTION IS SET TO LEFT, THE LEFT DISPLAY WILL SHOW "rdy" FOR READY AND THE RIGHT DISPLAY WILL SHOW "hLd" FOR HOLD (IF ACTIVATED). ONCE THE SERVICE PAN TIMER HAS ELAPSED, THE LEFT DISPLAY WILL FLASH "oLd". A PRESS OF THE LEFT TIMER BUTTON TO ACKNOWLEDGE THE END OF HOLDING TIME FOR THE SERVICE PAN WILL AUTOMATICALLY TRANSFER THE RIGHT TIMER HOLDING TIME (IF ACTIVATED) TO THE LEFT. THE BACK UP PAN (RIGHT PAN) IS THEN TRANSFER TO THE LEFT POSITION AND HAS NOW BECOME THE SERVICE PAN. A NEW BACK UP PAN CAN THEN BE INSERTED IN THE RIGHT POSITION AND THE BACK UP PAN TIMER CAN THEN BE ACTIVATED AGAIN TO START A NEW CYCLE.
 - "Llt" FOR TIME LINK TRANSFER DIRECTION: SAME AS "Lct" LINK TRANSFER MODE BUT THE SERVICE PAN DISPLAY WILL SHOW REMAINING HOLDING TIME INSTEAD OF TEXT MESSAGE "rdy".

- 6) **TRANSFER DIRECTION (FACTORY SET TO LEFT. ONLY AVAILABLE IN LINKED TRANSFER MODE AND TIME LINK TRANSFER MODE):** THE LEFT DISPLAY WILL SHOW "lft" FOR TRANSFER AND THE RIGHT DISPLAY WILL SHOW THE CURRENT SETTING. USE UP OR DOWN ARROW BUTTONS TO CHANGE TO "rt" FOR RIGHT OR "Lft" FOR LEFT.

TIME / TEMPERATURE ADJUSTMENT PROCEDURE

FIGURE 3



REV	DESCRIPTION	DATE	REV.	BY	DRAWN BY: S.A.	DATE: 11/14/2012	MARSHALL AIR SYSTEMS, INC.	
					GENERIC NAME: SCHEMATIC		SCHEMATIC	
					FAB	PRODUCT CLASS: HHC	120V 4.3A	
					MATERIAL: REFERENCE	SIZE: A	ROUTE: ELECT	DWG. NO.: 160815
								REV.: 0
								SCALE: NTS
								IMAGE MAY BE REDUCED
								CODE: DH5-3