OWNER'S MANUAL

MODEL DH1-1010 SERIES – HEATED HOLDING UNIT

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

The heated holding cabinet 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.

This DH5 Heated Holding Unit series can accommodate up to two half sheet or one full sheet pan per deck.

It also features a time/temperature controller for each deck in the unit. These integrated time/temperature controllers independently control each shelf top and bottom temperatures and also have one timer channel for each 1/3 pan in the unit for full control flexibility and maximum product integrity. An On/Off switch for each deck is easily accessible to the store personnel allowing them to turn on and off any desired deck.

These Heated Holding Units offer 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

Models:	DH1-1010 Series
# of Deck:	2
# Pans per Deck:	One Full Pan or Two ½ Sheet Pan
Height:	34.000"
Width:	30.875"
Depth:	19.875"
Weight:	125 Lbs.
Electrical:	208V – L1:8.6A, L2:8.6A, N:5.6A, G:0
Cord:	7' Long w/NEMA L14-20 plug
Approvals:	NSF, ETL/CETL

Patent Pending

174830 RV120817

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MODEL DH1-1010 SERIES – HEATED HOLDING UNIT

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER

FLAMMABLE VAPORS OR LIQUIDS IN THE

VICINITY OF THIS OR ANY OTHER APPLIANCE

AVERTISSEMENT
Ne pas entreposer ni utiliser de l'essence ni d'autres vapeurs ou liquides inflammables dans le voisinage de cet appareil, ni de tout autre appareil.

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.

AVERTISSEMENT: Une installation, un ajustement, une altération, un service ou un entretien non conforme aux normes peut causer des dommages à la propriété, des blessures ou la mort. Lisez attentivement les directives d'installation et d'opération et d'entretien avant de faire l'installation ou l'entretien de cet équipement

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

Cabinet area must be kept free of combustible materials and the flow of ventilation air must not be obstructed. Operating personnel must not perform any maintenance or repair functions. Contact your Qualified Service Company.

CLEAN UNIT AND BASE WITH A DAMP CLOTH/RAG AND A MILD CLEANER.

DO NOT USE A GREEN SCOTCH BRITE PAD OR ANY OTHER ABRASIVE CLEANING PAD. THE BLUE SCOTCH BRITE (NO SCRATCH) IS SAFE TO USE.

DO NOT USE CAUSTIC CLEANING SOLUTIONS SUCH AS OVEN CLEANER. USE ONLY MILD, NON-ABRASIVE CLEANER.

DO NOT IMMERSE IN WATER!

174830 RV120817

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ILLUSTRATIONS

SCHEMATICS

174830 RV101917

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PRE-INSTALLATION

1. The heated holding cabinet is packaged to minimize the risk of shipping damage. Immediately upon receipt, make certain to inspect the unit(s) for damage. **FILE ALL CLAIMS WITH THE FREIGHT CARRIER.**

2. Unpack and inspect the nugget cabinet. **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.

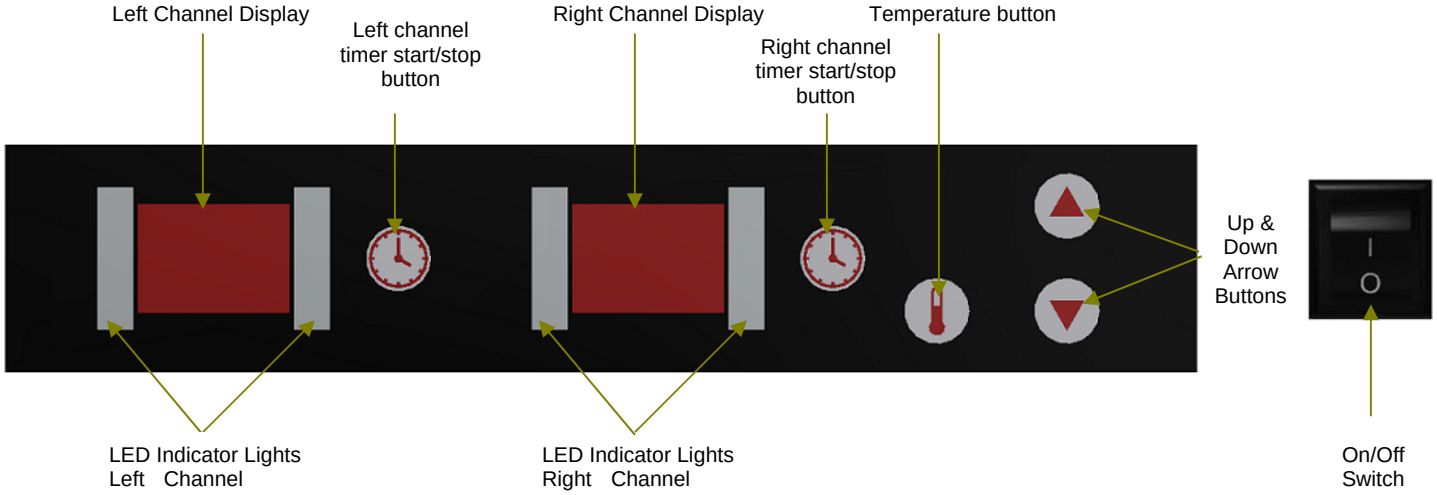
2. Place holding unit on stable base.

3. Plug unit into 208v L14-20 rated receptacle. Refer to the General Specifications on the front page of the manual to find out amp load of your model.

4. Installation shall comply with the latest version of the National Electrical Code, NFPA 70.

CONTROL USER INTERFACE

Each deck in the unit is controlled by an independent time/temperature controller.



CONTROL OPERATION:

CONTROLLER POWER UP:

1. Turn on the power switch of deck(s) to be used. Upon power up, the controller will briefly show the software version and then go to preheat mode and the display will show "PHt"

PREHEAT:

1. The controller will stay in preheat mode ("PHt") for the entire preheat period (preheat time parameter) even though both heaters (top and bottom) have reached set points before the end of

that period. If the controller is inadvertently turned OFF and back ON, the preheat period can be bypassed by a 3 second press of the down arrow button only if both heaters are within the allowed differential temperature set points (preheat bypass temperature parameter).

2. After preheat, the controller goes into idle mode "---". At this time, any timer can be started.

HOLDING TIME CYCLES:

1. To start a cycle, press a timer start/stop button. The display will show the holding time value in minutes and starts the countdown. The LED bars for that timer channel will then light steady green.

2. When the timer reaches the pre-alert value, the display will then alternate between showing the remaining time and "drP" for DROP, the LED bars will start flashing and a beeping will start. The user then has to acknowledge the pre-alert by a press of the timer start/stop button. The display will then flash the remaining time for the rest of the cycle, the LED bars will go back to steady and the beeping will stop.

3. When the timer reaches the "000" value, the display will flash "000", the LED bars will flash red and the beeping will start until the user acknowledges the end of the cycle by pressing the timer start/stop button. The timer will then go back to idle mode "---", the led bars will turn OFF and the beeping will stop.

4. **This step only applicable to controls that are set to interdependent group configuration. See Group Configuration into "Programming – General Settings" for more information.** If a subsequent timer cycle is started while previous timer cycle(s) are still active, the display will show the holding time value in minutes and start countdown but the LED bars will turn steady red to indicate that the associated pan is not yet to be used. Only when all previously started cycles have been elapsed or cancelled that the LED bars will change to green to let the user know that the associated pan can now be used.

5. Any holding cycle can be cancelled at any time by a **3 second press** of the timer start/stop button.

6. If at any time during normal operation, one heater's temperature is falling or rising out of the allowed differential from set point (ready mode differential parameter), the displays will alternate between current mode and "LO" or "HI" to alert the user that the heater's temperature is too low or too hi. This should remain until the heaters are back within the allowed differential.

CURRENT TEMPERATURES DISPLAY:

1. To view the heaters current temperature, press and hold the temperature button for 3 seconds. The display will then alternate between "toP" for top heater and its current temperature value.

2. To view the bottom heater current temperature, press the temperature button again. The display will then alternate between "bot" for bottom heater and its current temperature value.

3. A press of the temperature button will cycle between top and bottom current temperatures.

4. To exit temperature view mode and return to previous mode, press and hold the temperature button.

DAY PART CONFIGURATION:

This functionality allows the user to quickly switch between two sets of configurations, day part 1 "dP1" (example: breakfast) and day part 2 "dP2" (example: lunch, dinner) to hold different food product or to better accommodate the restaurant daily need.

To display the active day part configuration, cancel all timers so all displays are in idle mode "---" and press and release the up arrow button. The displays will show the active configuration for a few seconds and return to the previous mode. To switch from one configuration to the other, cancel all timers so all displays are in idle mode "---" and press and hold the up arrow button for 3 seconds. The displays will briefly show the current configuration followed by the newly active configuration and then goes back to normal operation.

CONTROL PROGRAMMING - HOLDING TIME:

1. To change a timer channel holding time value, the unit needs to be in preheat mode "PHt" or in idle mode "---".

2. Press and hold for 3 seconds the timer start/stop button for the channel to be changed. The display will then flash the current setting in minutes.

3. Use the up/down arrow buttons to change to new setting.

4. Press and hold start/stop button for 3 seconds to save the new setting and go back to idle mode.

5. If necessary, repeat for other channels.

CONTROL PROGRAMMING – GENERAL SETTINGS:

NOTE: Programming mode can only be access while unit is in preheat "PHt" mode or idle mode. (No timer activated.)

To access programming mode, press and hold the up and down arrow button for 5 seconds. To save changes and exit programming mode, press and hold temperature button for 3 seconds.

The display will alternate between the parameter/functionality display codes and its current value (if applicable). Press the temperature button to cycle through the parameters/functionalities and use the up and down arrow buttons to change the parameter value. For channel specific parameters (parameters 4, 5 and 6) select channel to be edit by pressing the associated timer button first, then up/down arrow buttons to edit value. Here is the list of the user programmable parameters and functionalities with their display code:

1. " CF" Configuration download functionality. See "USB CONFIGURATION DOWNLOAD" section for more details.
2. "dPn" Indicates which set of day part values will be edited, dP1 or dP2.
3. "grP" Group configuration.
   - " 0": Indicates that all channels on this controller are set to be independent.
   - " 1": Indicated that all channels on this controller are interdependent. In this setting, the user can keep track of which pan was inserted first by the state of the channels LED light bars. The channel that was started first will have the green LED light bars while any subsequent timers that are started will have red LED light bars. This lets the user know to use the pan associated with the green

LED light bars first until timer is expired or cancelled. The LED light bars of the next channel in line will then turn green and so on.

" 2": This group setting allows any two adjacent timer channels to be paired. The user can then keep track of the oldest product in a case where two pans hold the same product. See pairing parameter ("Par") below for more setting details.

4. "Par" In the case where grouping ("grP") is set to "2" for channel pairing, this parameter is used to define any pairing between two channels. Note that both paired channels need to be setup properly for unit to operate correctly. First select channel using timer button then choose between "no", "uP", "rt", "dn" or "LF". Not all options are available for some units.
5. Product Name: The user can assign a product name to each channel. This will display the product name instead of the holding time during operation is activated (see next parameter). Select channel to be edited first, then use up/down arrow buttons to change selected character. Subsequent presses of the same timer button will cycle through the characters.
6. "Prd" This parameter defines which channel(s) will have the product name feature activated. First select channel to be edited the choose between "yes" to display product name or "no" to display holding time. **Note that the user can press the down arrow button during normal operational to display remaining holding time of any active timer channels.**
7. "ALt" Drop time (expressed as a percentage of the holding time)
8. "CnC" Timer cancel mode
   - " 1": Single press of channel button
   - " 2": Double press of channel button
   - "HLd": Press and hold of channel button
9. "toP" Top heater temperature set point (in degree Fahrenheit or Celsius)
10. "bot" Bottom heater temperature set point (in degree Fahrenheit or Celsius)
11. "PHt" Preheat time (in minutes)
12. "bPS" Preheat bypass temperature differential (in degree Fahrenheit or Celsius).

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/rag and a mild cleaner.

   DO NOT USE A <u>GREEN</u> SCOTCH BRITE PAD OR ANY OTHER ABRASIVE CLEANING PAD. THE BLUE SCOTCH BRITE (NO SCRATCH) IS SAFE TO USE.
   DO NOT USE CAUSTIC CLEANING SOLUTIONS SUCH AS OVEN CLEANER. USE ONLY MILD, NON-ABRASIVE CLEANER.
   DO NOT IMMERSE IN WATER!
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.

TROUBLESHOOTING CHART

Before trouble shooting is started: check unit is plugged in, check for tripped circuit breaker and check that power switch on.

**** DISASSEMBLING HEATER VOIDS WARRANTY ****

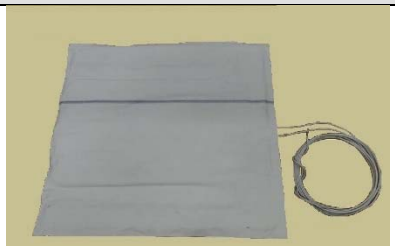
PROBLEM	POSSIBLE CAUSE	SOLUTION
1. CONTROL DISPLAYS "PHt"	A. NORMAL OPERATION CABINET HAS NOT BEEN ON FOR 20 MIN	A. WAIT 20 MINUTES
	B. INADVERTANT POWER DISRUPTION IF SWITCH TURNED OFF BY ACCIDENT, POWER DISRUPTION BY THUNDERSTORM ETC.	B. PRESS AND HOLD DOWN ARROW FOR 3 SECONDS TO CLEAR "PHt" CYCLE
2. UNIT WILL NOT TURN ON	A. UNIT UNPLUGGED	A. PLUG IN UNIT
	B. IS CONTROLLER ON/OFF SWITCH "ON"	B. TURN SWITCH ON
	C. OUTLET HAS NO POWER	C. CHECK CIRCUIT BREAKER
	D. CORD DEFECTIVE	D. REPLACE DEFECTIVE CORD
	E. DOES POWER SUPPLY BOARD HAVE 120V INCOMING	E. REPLACE SWITCH
	F. DOES POWER SUPPLY BOARD HAVE 8.5 VDC OUTGOING TO CONTROLLER	F. REPLACE POWER SUPPLY BOARD
	G. BAD CONTROLLER	G. REPLACE CONTROLLER
3. UNIT NOT HEATING	A. HEATER IS TURNED "OFF"	A. SEE "PROGRAMMING USER LEVEL" SECTION TO TURN HEATER ON
	B. WIRES NOT PLUGGED INTO BACK OF CONTROLLER	B. PLUG WIRES INTO CONTROLLER
	C. NO VOLTAGE TO DC SIDE OF SOLID STATE RELAY	C. LOOSE WIRES, REPLACE CONTROLLER

PROBLEM	POSSIBLE CAUSE	SOLUTION
3. UNIT NOT HEATING	D. SOLID STATE RELAY HAS DC VOLTAGE, NOT ALLOWING POWER TO PASS THROUGH	D. REPLACE SOLID STATE RELAY
	E. HEATING BLANKET WIRES HAVE POWER NOT HEATING	E. LOOSE WIRES, REPLACE HEATING BLANKET
4. LOW PRODUCT TEMPERATURE	A. TEMPERATURE SET POINTS ARE TOO LOW	A. ADJUST TO HIGHER TEMPERATURE SET POINT (SEE PROGRAMMING SECTION)
	B. EXCESSIVE AIR DRAFT(S)	B. SHIELD DRAFT(S)
5. HIGH PRODUCT TEMPERATURE	A. TEMPERATURE SET POINTS ARE TO HIGH	A. ADJUST TO LOWER TEMPERATURE SET POINT (SEE PROGRAMMING SECTION)
6. UNIT FLASHES "+Pr" "LO" (TEMPERATURE LOW)	A. EXCESSIVE AIR DRAFT(S)	A. SHIELD DRAFT(S)
	B. LOOSE WIRE IN ELECTRICAL CABINET	B. CHECK WIRING
	C. BAD TEMPERATURE SENSOR	C. REPLACE SENSOR
	D. BAD SOLID STATE RELAY	D. REPLACE SOLID STATE RELAY
	E. BAD HEATING BLANKET	E. REPLACE HEATING BLANKET
7. UNIT FLASHES "+Pr" "HI" (TEMPERATURE HIGH)	A. BAD SOLID STATE RELAY	A. REPLACE SOLID STATE RELAY
	B. BAD TEMPERATURE SENSOR	B. REPLACE TEMPERATURE SENSOR
	C. BAD CONTROLLER	C. REPLACE CONTROLLER
8. ERROR CODE: "OPN" "UP" OR "LO" "OPEN TEMPERATURE SENSOR" "uP" UPPER DECK OR "LO" LOWER DECK	A. TEMPERATURE SENSOR WIRES BECAME DISCONNECTED	A. RECONNECT TEMPERATURE SENSOR WIRES
	B. BAD SENSOR	B. REPLACE SENSOR
	C. BAD CONTROLLER	C. REPLACE CONTROLLER

PROBLEM	POSSIBLE CAUSE	SOLUTION
9. ERROR CODE "SHT" "uP" OR "LO" "SHORTED TEMPERATURE SENSOR" "uP" UPPER DECK OR "LO" LOWER DECK	A. TEMPERATURE WIRES ARE SHORTED B. BAD SENSOR C. BAD CONTROLLER	A. CHECK WIRES B. REPLACE SENSOR C. REPLACE CONTROLLER
10. TIMER COLOR LEDS NOT ILLUMINATING	A. BAD CONTROLLER	A. REPLACE CONTROLLER
11. ERROR "dft" ON POWER UP	A. INTERNAL MEMORY DAMAGED	A. REPLACE CONTROLLER
12. CABINET FAN NOT WORKING	A. NO VOLTAGE TO FAN B. BAD FAN	A. CHECK WIRING B. REPLACE FAN

****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.

REPLACEMENT PARTS



Part Replacement Time: 43 min

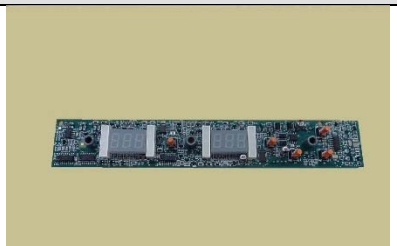
502978 - Blanket, Heater 240V

These heating blankets are used in the bottom heaters of each deck. A defective blanket could cause non-heating of the associated deck bottom heater and therefore an undesired change in the food product quality.

Part Replacement Time: 6 min

502091 - Connector, Strain Relief

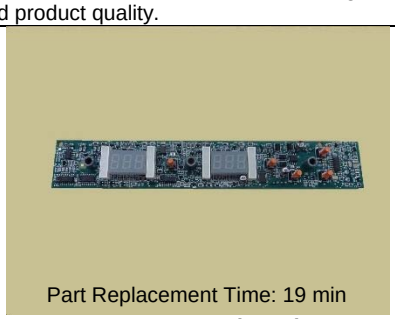
Strain relief used with main power cord and should be replaced if missing or damaged.



Part Replacement Time: 19 min

174826 – Control, Deck 1

Time/temperature controller factory pre-programmed according to customer's specific settings. Replace if the controller is not operating according to specs or if it won't turn on when 8.5VDC is supplied to it.



Part Replacement Time: 19 min

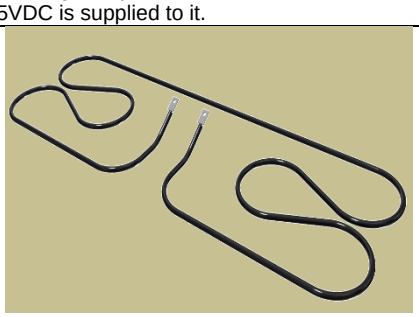
174837 – Control, Deck 2

Time/temperature controller factory pre-programmed according to customer's specific settings. Replace if the controller is not operating according to specs or if it won't turn on when 8.5VDC is supplied to it.

Part Replacement Time: 7 min

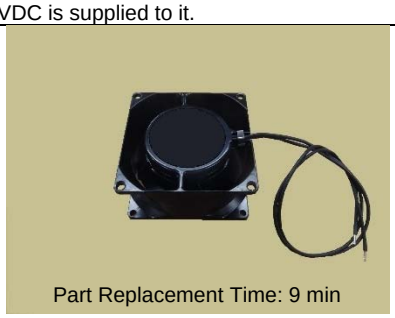
504264 - Cord, 12/4 NEMA L14-20P

Main power cord. Damaged cord can cause unit to stop operating and should be replaced.



156008 – Element, 208V Rebend

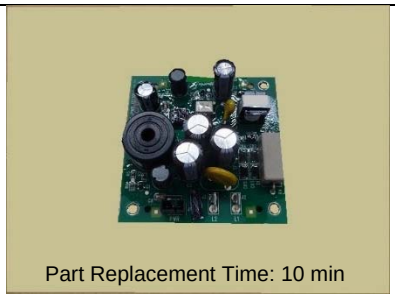
Top heater element. Two elements are used for each top heaters. Bad element could cause non-heating of the associated deck top heater and therefore an undesired change in the food product quality.



Part Replacement Time: 9 min

171132 - Fan, Asby

Fan used inside control box to cool electrical components. Failure can cause electrical components to overheat and fail or alter food product quality. Should be replaced if worn or damaged.



Part Replacement Time: 10 min

504318 - Power Supply

The 120VAC to 8.5VDC power supply is used to power the time/temperature controllers. A defective power supply could cause all controllers to not turn on when powered.

Part Replacement Time: 8 min

504023 - Relay, Solid State 25A

SSRs are used to turn on and off power delivered to their associated heater once it reaches temperature set point. Failure will cause the associated heater to excessively rise above set point and might cause permanent damage to it.

REPLACEMENT PARTS

Part Replacement Time
Upper Platen: 21 min
Lower Platen: 27 min

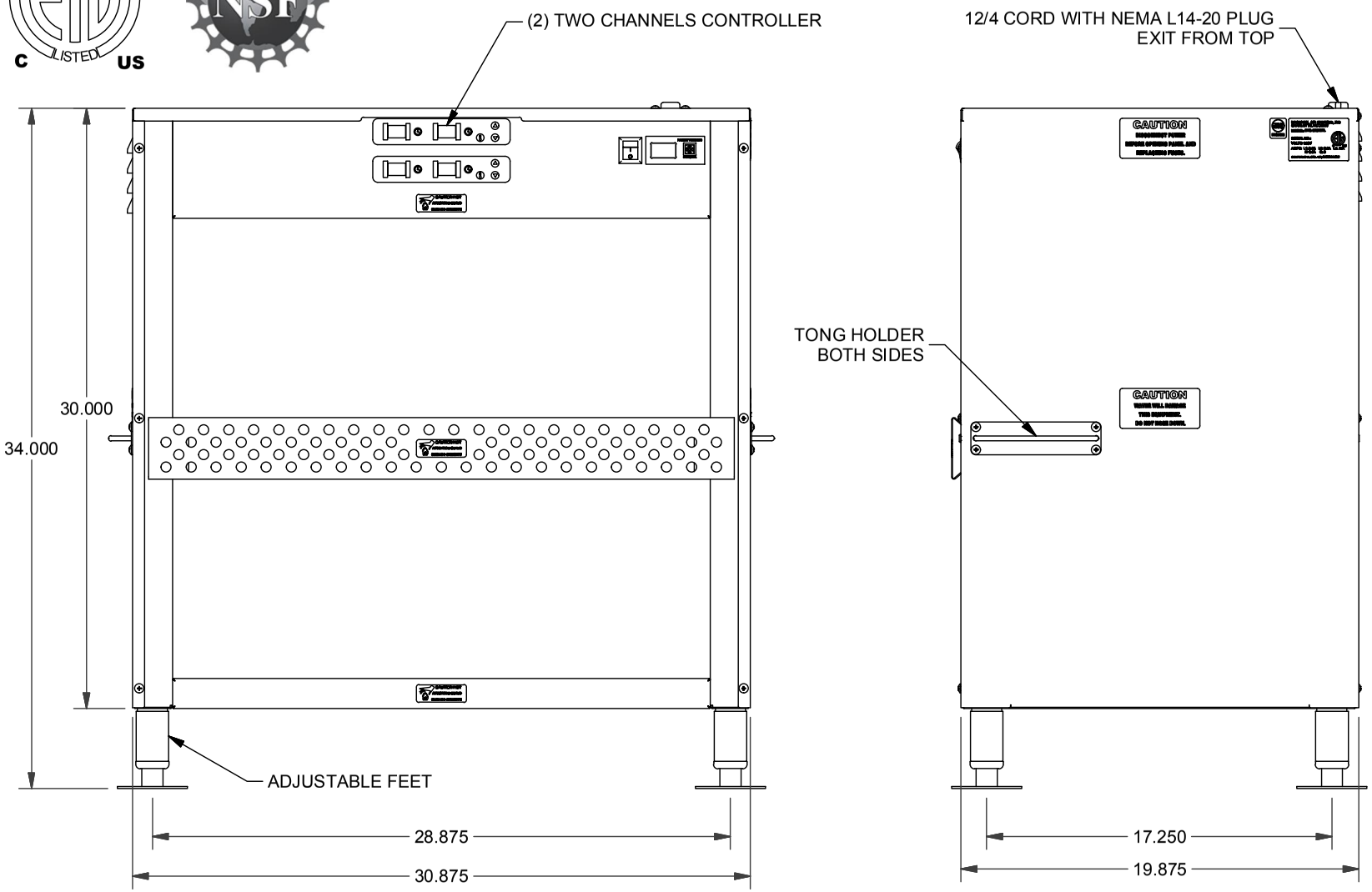
502064 - Sensor, RTD, 48"

Used to read heater's temperature. If a RTD sensor goes bad or is disconnected, its associated controller will beep and the display will flash either "oPn" or "SHt" to indicate failure

Part Replacement Time: 10 min

502425 - Switch, Double Pole

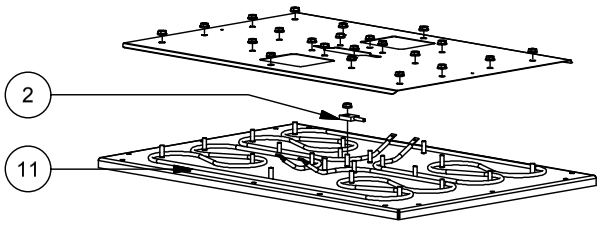
A bad switch could cause the associated controllers to not turn on. Bad or damaged switch should be replaced immediately.



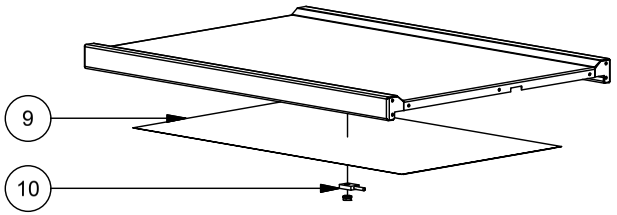
OVERALL DIMENSIONS DH1-1010 SERIES

FIGURE 1

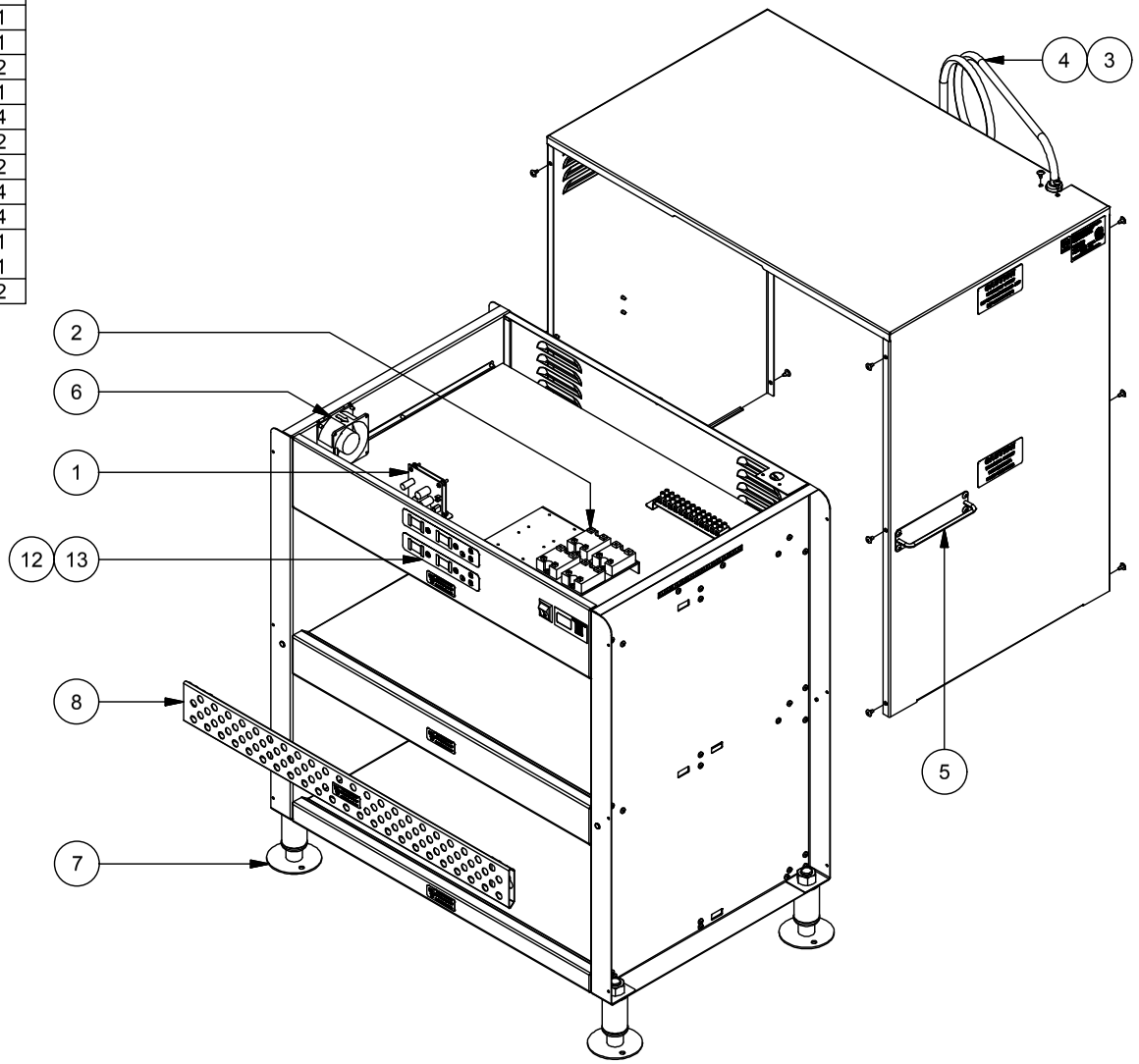
Parts List			
ITEM	PART NO.	DESCRIPTION	QTY
1	504318	POWER SUPPLY	1
2	504023	RELAY, SOLID STATE 25A	4
3	502091	CONNECTOR, STRAIN RELIEF 12/3	1
4	504264	CORD SET, 12/4 SJOOW 90 DEG C	1
5	174834	ASBY, TONG HOLDER	2
6	171132	FAN, COOLING, ASBY	1
7	158911	LEG ASBY, 4"	4
8	174835	ASBY, HEAT GUARD	2
9	502978	BLANKET, BOTTOM HEATER	2
10	502064	SENSOR, RTD, 48"	4
11	156008	ELEMENT, TOP HEATER (2 PER HEATER)	4
12	174826	CONTROL, DECK 1	1
	174837	CONTROL, DECK 2	1
13	504387	OVERLAY, 2 CH. LED CONTROLLER	2



TOP HEATER ASBY

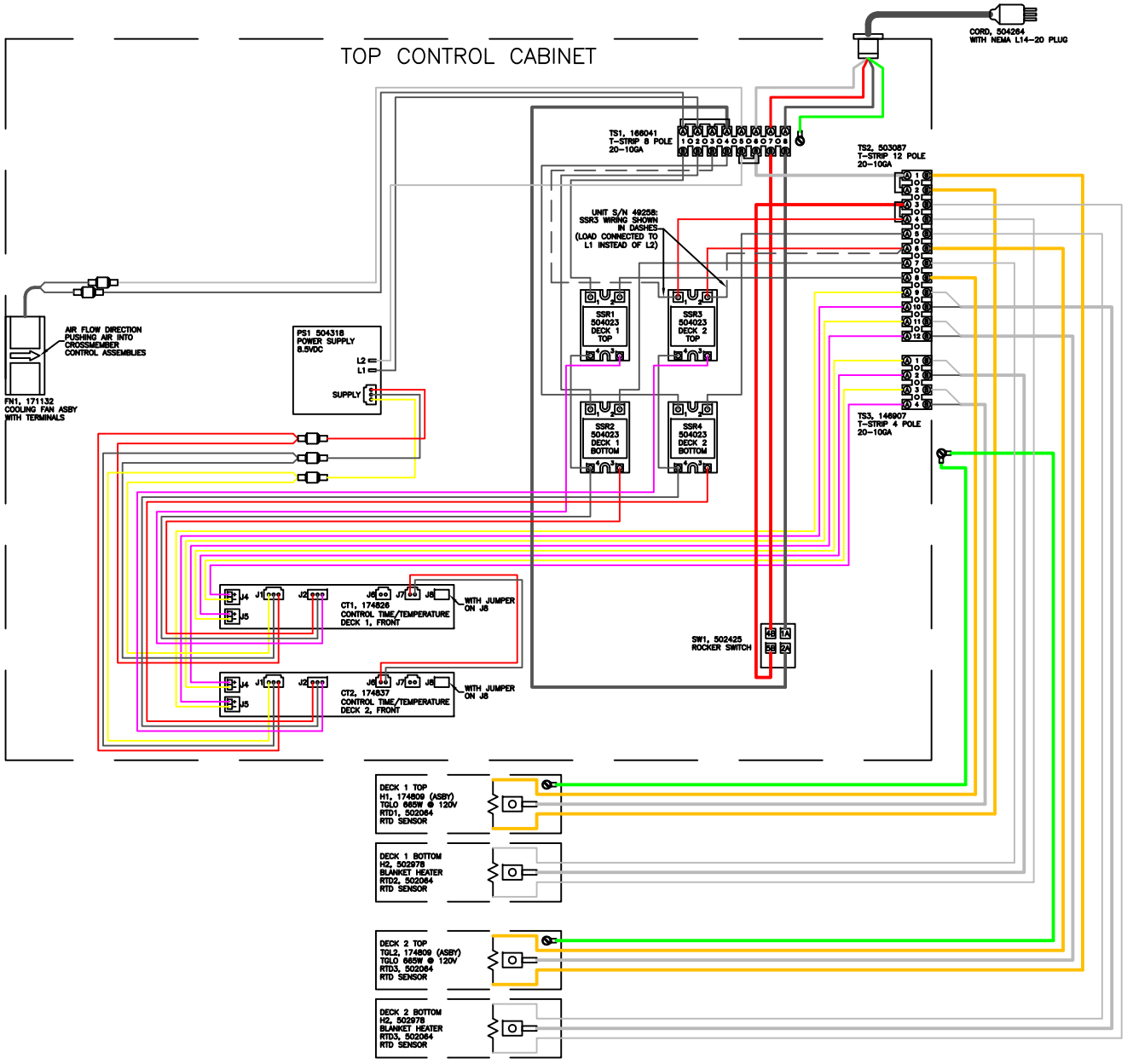


BOTTOM HEATER ASBY



REPLACEMENT PARTS DH1-1010 SERIES

FIGURE 2



REV	DESCRIPTION	DATE	REV. BY
1	ADDED ALT. WIRING, DECK 2 CONTROL WAS 174826	12/8/2017	S.A.

DRAWN BY: S.A. DATE: 12/8/2017

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB

PRODUCT CLASS: HHC

MATERIAL: REFERENCE

__.___" X __.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC – HOLDING CABINET 2 X 2 PASS THRU

SIZE: A | ROUTE.: ELECT | DWG. NO.: 174829 | REV.: 1

SCALE: NTS IMAGE MAY BE REDUCED NTS

CODE: DH1-1010B SERIES