

Royal Vision Cooler

RVCH-027 Health Safety Controller Information



Royal Vendors, Inc.

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Health Safety Controller Operation

Serial numbers 201326RA00007 and after

1. When the controller is first powered up, a Health Safety error will be present, the diagnostic LED will be on continuously, and the controller will supply (-) 24VDC to lock the door. This is intended to prevent access to spoiled food or drinks whenever the previous state of the refrigeration is unknown.
2. To reset the Health Safety error, press the RESET switch. This will clear all errors, supply (+) 24VDC to the solenoid to unlock the door, and initiate a timer.
3. Upon reset, the controller will enter a “grace” period. At the end of this grace period, the controller will sample the cabinet temperature to see if the temperature is below 41°F (5° C). The length of this grace period is determined by the state of the door switch at the time the reset button is pressed.
 - a. If the door is open at the time of reset, the controller will allow a 60-minute grace period.
 - b. If the door is closed, the controller will allow a 30-minute grace period.
 - c. If at the end of either grace period (30 or 60 minutes) the temperature is not below 41°F (5° C), the controller will trigger a Health Safety error, supply (-) 24VDC to lock the door, and the diagnostic LED will indicate a Health Safety error.
4. The controller constantly monitors the cabinet temperature. After the initial grace period has expired, the controller will assume normal operation and watch for an unexpected rise in temperature.
 - a. If the temperature is observed to rise above 41°F (5° C), the controller will start a 15-minute timer.
 - b. If the temperature remains above 41°F (5° C) for more than 15 minutes, the controller will trigger a Health Safety error and supply (-) 24VDC to lock the door.
 - c. If within this 15-minute period the temperature falls below 41°F (5° C), the 15-minute timer will be reset and no error will occur.
5. The controller constantly monitors the state of the door switch. If the controller determines that the door switch has cycled (i.e., gone from closed to open or open to closed), the controller will begin a grace period. The length of this grace period will depend upon the state of the door after the transition has occurred.
 - a. If the door remains open, the controller will allow a 60-minute grace period.
 - b. If the door remains closed, the controller will allow a 30-minute grace period.
 - c. If the door again cycles during the timeout period, the grace period will be reset and the countdown will be based upon the state of the door switch based on rules (a) or (b) above.
 - d. At the end of the grace period, the cabinet temperature must be at or below 41°F (5°C). If the temperature is above 41°F (5°C), the Health Safety error will be triggered and supply (-) 24VDC to lock the door. If the temperature is below 41°F (5°C), normal operation will resume.

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6. The controller constantly monitors the AC power through an AC power detector circuit. When AC power is disrupted, the controller will shed all loads (LED, sensors, etc.), immediately supply (-) 24VDC to the solenoid from a capacitor or battery to lock the door, and enter into a low-power state of operation. The controller will remain in this low-power state for 30 minutes or until AC power returns. If AC power returns before the 30-minute timeout period has expired, the controller will sample the temperature upon power-up.
 - a. If the temperature is below 41°F (5° C), the controller will return to normal operation and supply (+) 24VDC to unlock the door.
 - b. If the temperature is above 41°F (5° C), the controller will trigger the Health Safety error and supply (-) 24VDC to lock the door (to ensure the door is still locked).
 - c. If power is not restored within the 30-minute timeout period, the controller will trigger the Health Safety error and enter into stop mode.

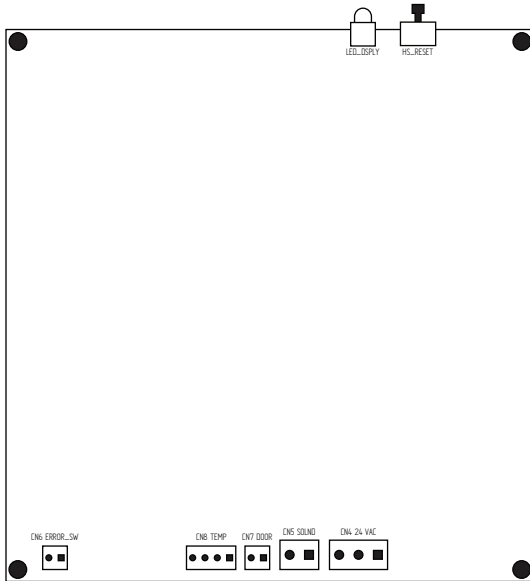
Serial numbers 201326RA00006 and before

1. When the controller is first powered up, a Health Safety error will be present, the diagnostic LED will be on continuously, and the door solenoid will not be activated. This is intended to prevent access to spoiled food or drinks whenever the previous state of the refrigeration is unknown.
2. To reset the Health Safety error, press the RESET switch. This will clear all errors, activate the door solenoid, and initiate a timer.
3. Upon reset, the controller will enter a “grace” period. At the end of this grace period, the controller will sample the cabinet temperature to see if the temperature is below 41°F (5° C). The length of this grace period is determined by the state of the door switch at the time the reset button is pressed.
 - a. If the door is open at the time of reset, the controller will allow a 60-minute grace period.
 - b. If the door is closed, the controller will allow a 30-minute grace period.
 - c. If at the end of either grace period (30 or 60 minutes) the temperature is not below 41°F (5° C), the controller will trigger a Health Safety error, the door will be locked, and the diagnostic LED will indicate a Health Safety error.
4. The controller constantly monitors the cabinet temperature. After the initial grace period has expired, the controller will assume normal operation and watch for an unexpected rise in temperature.
 - a. If the temperature is observed to rise above 41°F (5° C), the controller will start a 15-minute timer.
 - b. If the temperature remains above 41°F (5° C) for more than 15 minutes, the controller will trigger a Health Safety error.
 - c. If within this 15-minute period the temperature falls below 41°F (5° C), the 15-minute timer will be reset and no error will occur.
5. The controller constantly monitors the state of the door switch. If the controller determines that

the door switch has cycled (i.e., gone from closed to open or open to closed), the controller will begin a grace period. The length of this grace period will depend upon the state of the door after the transition has occurred.

- a. If the door remains open, the controller will allow a 60-minute grace period.
 - b. If the door remains closed, the controller will allow a 30-minute grace period.
 - c. If the door again cycles during the timeout period, the grace period will be reset and the countdown will be based upon the state of the door switch based on rules (a) or (b) above.
6. At the end of the grace period, the cabinet temperature must be at or below 41°F (5°C). If the temperature is above 41°F (5°C), the Health Safety error will be triggered. If the temperature is below 41°F (5°C), normal operation will resume.
 7. The controller constantly monitors the AC power through an AC power detector circuit. When AC power is disrupted, the controller will shed all loads (solenoid, LED, sensors, etc.) and enter into a low-power state of operation.
 8. The controller will remain in this low-power state for 30 minutes or until AC power returns. If AC power returns before the 30-minute timeout period has expired, the controller will sample the temperature upon power-up.
 - a. If the temperature is below 41°F (5° C), the controller will return to normal operation.
 - b. If the temperature is above 41°F (5° C), the controller will trigger the Health Safety error.
 - c. If power is not restored within the 30-minute timeout period, the controller will trigger the Health Safety error and enter into stop mode.

Health Safety Controller Pinouts



Health Safety controller (serial numbers 2013-- and after).

Serial numbers 201326RA00007 and after

The Health Safety controller is responsible for all proper function of the Health Safety system. The board is located in the bottom right section of the Cooler’s cabinet and is protected by a cover. Removing this cover will expose the board, along with all wiring connections to it.

OPERATION REQUIREMENTS: The Health Safety controller requires approximately 24 volts AC from the transformer. This allows the controller to function and to supply power to the components listed below.

PINOUTS: The Health Safety Controller has several electrical pinouts, a reset button, and an indicator LED. The following section outlines all the controller’s pinouts.

The word *key* refers to the small plastic insert plugged into a position of the wire harness connector. The purpose of the key is to prevent connecting the harnessing backward or upside-down. The “keyed position” is a blank position within the pinout (no pin) in which a key is inserted. Some pinouts may have several blank positions with a key plugged into one or more of the positions. You can use the key to determine which end of the pinout is Pin 1.

24 VAC (Position CN4): The harness connecting to this pinout comes from the transformer. It is imperative that the correct harness be connected to this pinout. If this harness is not connected, the Health Safety system will not function and the door will be locked.

PIN	WIRE COLOR	SIGNAL / FUNCTION
1	Red	24 VAC power
2	Green	Ground
3	Black	24 VAC power

SOLND (Position CN5): This harness connects to the solenoid. The solenoid is used to lock or unlock the door, depending upon the signal the controller receives from the door switch and the temperature sensor.

PIN	WIRE COLOR	SIGNAL / FUNCTION
1	Red	24 VDC power for solenoid
2	Black	Ground

ERROR_SW (Position CN6): This harness connects to the external reset switch, located below the grille along the lower right-hand side. A reset button can also be found on the controller itself, to the left of this pinout. Resetting of the Health Safety system is performed using either of these two buttons.

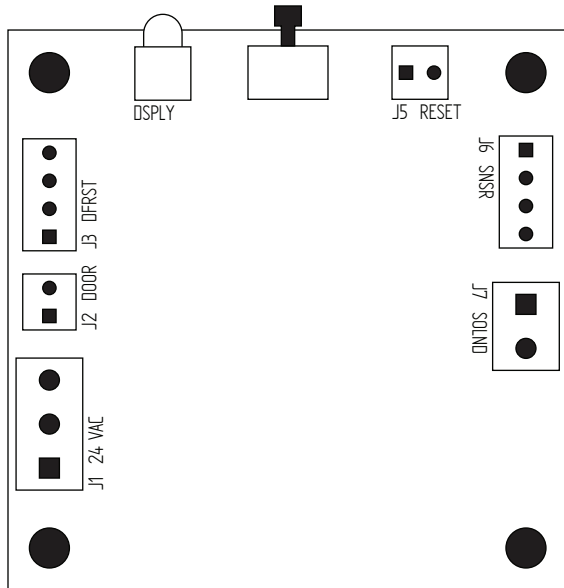
PIN	WIRE COLOR	SIGNAL / FUNCTION
1	Red	Reset signal
2	Black	Ground for switch signal

DOOR (Position CN7): The harness connecting to this pinout comes from the door switch. From the signal received from this switch, the controller determines the current state of the door (open or closed).

PIN	WIRE COLOR	SIGNAL / FUNCTION
1	Red	Door switch signal; when the door is open, the switch is closed.
2	Black	Return to ground for switch signal

SNSR (Position CN8): This harness connects to the temperature sensor, which is mounted in the refrigeration deck. The controller uses the information received from this sensor to monitor the temperature inside the cabinet.

PIN	WIRE COLOR	SIGNAL / FUNCTION
1	Red	5 VDC
2	White	Temperature sensor signal
3	-	Key
4	Black	Return to ground



Health Safety controller (serial numbers 2013-- and before).

Serial numbers 201326RA00006 and before

The Health Safety controller is responsible for all proper function of the Health Safety system. The board is located in the bottom right section of the Cooler’s cabinet and is protected by a cover. Removing this cover will expose the board, along with all wiring connections to it.

OPERATION REQUIREMENTS: The Health Safety controller requires approximately 24 volts AC from the transformer. This allows the controller to function and to supply power to the components listed below.

PINOUTS: The Health Safety Controller has several electrical pinouts, a reset button, and an indicator LED. The following section outlines all the controller’s pinouts.

The word *key* refers to the small plastic insert plugged into a position of the wire harness connector. The purpose of the key is to prevent connecting the harnessing backward or upside-down. The “keyed position” is a blank position within the pinout (no pin) in which a key is inserted. Some pinouts may have several blank positions with a key plugged into one or more of the positions. You can use the key to determine which end of the pinout is Pin 1.

24 VAC (Position J1): The harness connecting to this pinout comes from the transformer. It is imperative that the correct harness be connected to this pinout. If this harness is not connected, the Health Safety system will not function and the door will be locked.

PIN	WIRE COLOR	SIGNAL / FUNCTION
1	Red	24 VAC power
2	Green	Ground
3	Black	24 VAC power

DOOR (Position J2): The harness connecting to this pinout comes from the door switch. From the signal received from this switch, the controller determines the current state of the door (open or closed).

PIN	WIRE COLOR	SIGNAL / FUNCTION
1	Red	Door switch signal; when the door is open, the switch is closed.
2	Black	Return to ground for switch signal

DFRST (Position J3): This pinout is not used.

RESET (Position J5): This harness connects to the external reset switch, located below the grille along the lower right-hand side. A reset button can also be found on the controller itself, to the left of this pinout. Resetting of the Health Safety system is performed using either of these two buttons.

PIN	WIRE COLOR	SIGNAL / FUNCTION
1	Red	Reset signal
2	Black	Ground for switch signal

SNSR (Position J6): This harness connects to the temperature sensor, which is mounted in the refrigeration deck. The controller uses the information received from this sensor to monitor the temperature inside the cabinet.

PIN	WIRE COLOR	SIGNAL / FUNCTION
1	Red	5 VDC
2	White	Temperature sensor signal
3	-	Key
4	Black	Return to ground

SOLND (Position J7): This harness connects to the solenoid. The solenoid is used to lock or unlock the door, depending upon the signal the controller receives from the door switch and the temperature sensor. If power is lost to the solenoid, the door will be locked.

PIN	WIRE COLOR	SIGNAL / FUNCTION
1	Red	34 VDC power for solenoid
2	Black	Ground

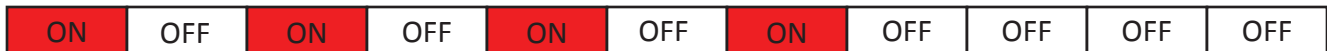
LED Status Indicator

The Health Safety controller has an on-board bi-color LED lamp (at the position marked “LED_DSPLY” or “DSPLY”) that indicates the state of its operations through a series of LED flash sequences. Each flash within a given sequence is separated by a one-second pause. Each flash sequence is terminated by a four-second pause. Multiple error codes are sequenced one after another and are separated by a four-second pause.

For example, the flash sequence below would indicate Message 1 (“The door is closed and everything is good”):



The following would indicate Message 4 (“The controller has a health safety error”):



Serial numbers 201326RA00007 and after

Flashes	Meaning / Interpretation
0	(LED on continuously) The controller is waiting to be reset.
1	Door is closed and everything is good. (green)
2	Door is open and everything is good. (green)
3	The temperature sensor is working, but the temperature is greater than 41°F (5°C). (green)
4	The controller has a health safety error. (red)
5	The temperature sensor is unplugged or defective.
6	<i>not used</i>
7	<i>not used</i>
8	<i>not used</i>
9	Health safety error caused by the door being open too long.

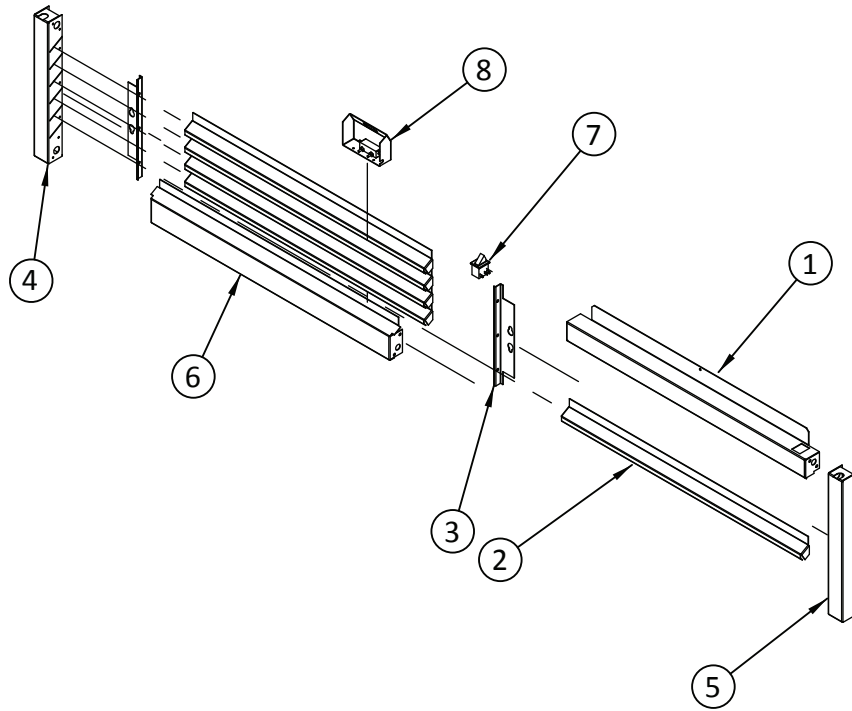
Serial numbers 201326RA00006 and before

Flashes	Meaning / Interpretation
0	(LED on continuously) The controller is waiting to be reset.
1	Door is closed and everything is good. (green)
2	Door is open and everything is good. (green)
3	The temperature sensor is working, but the temperature is greater than 41°F (5°C). (green)
4	The controller has a health safety error. (red)
5	The temperature sensor is unplugged or defective.
6	The door lock solenoid is shorted or drawing too much current.
7	The door lock solenoid open or not drawing enough current.
8	The controller has just been reset.
9	Health safety error caused by the door being open too long.

Refrigeration Control

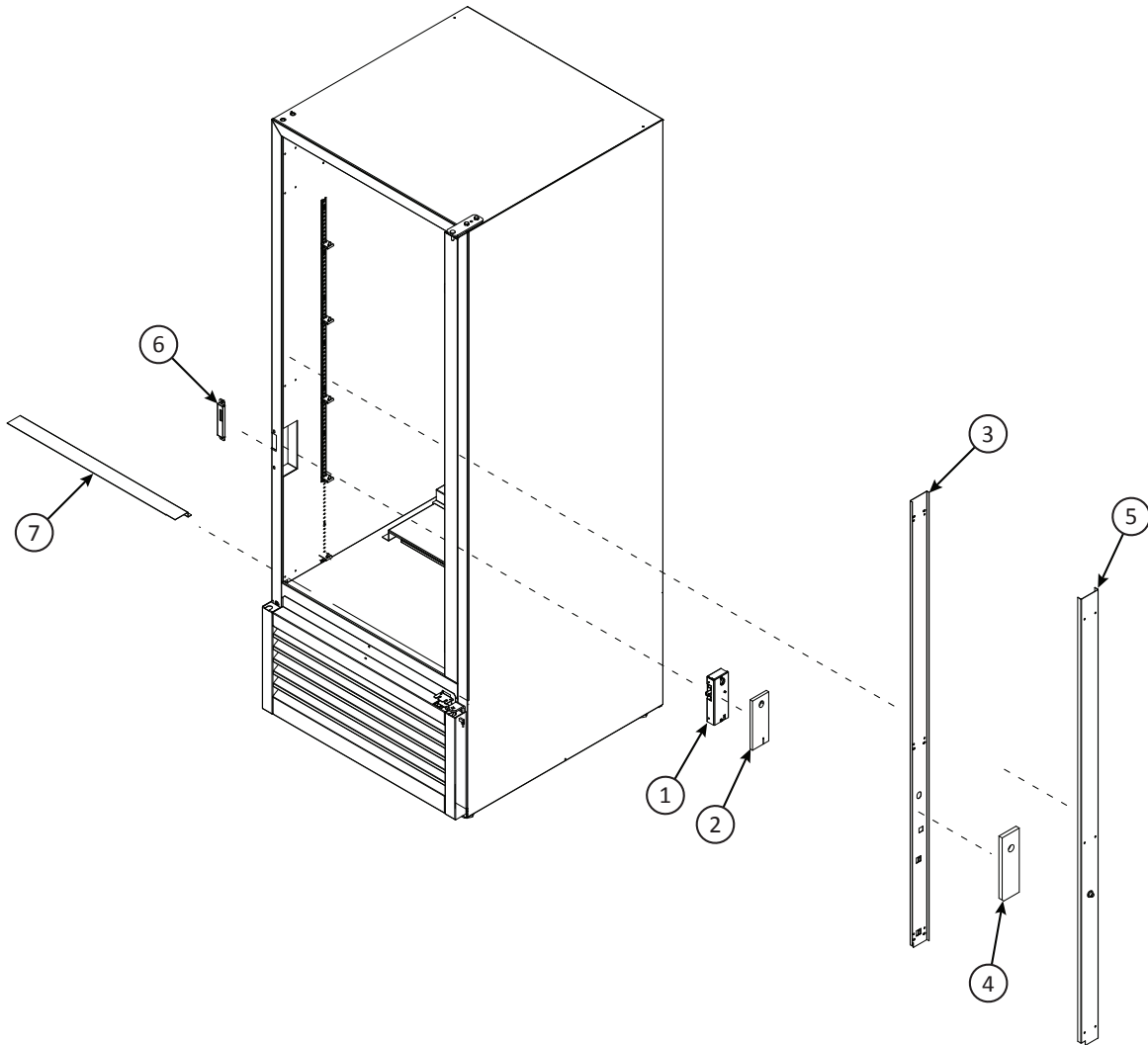
The recommended refrigeration setting for the Health Safety Cooler is 7-8 on the refrigeration control knob.

Grille Assembly



Item Number	Description	Part Number
1	Grille Frame, Top	370029
2	Grille Louver	370022
3	Grille Frame, Bottom	370023
4	Grille Frame, Left	370024
5	Grille Frame, Right	370025
6	Grille Mounting Bracket	370026
7	Door Switch	835019
8	Reset Button Assembly <i>(includes all items below)</i>	370031
•	Reset Button Bracket	370032
•	Reset Button	835023
•	Machine Screw, #6-32 x 1.25"	E901041
•	Keps Nut, #6-32	E905018

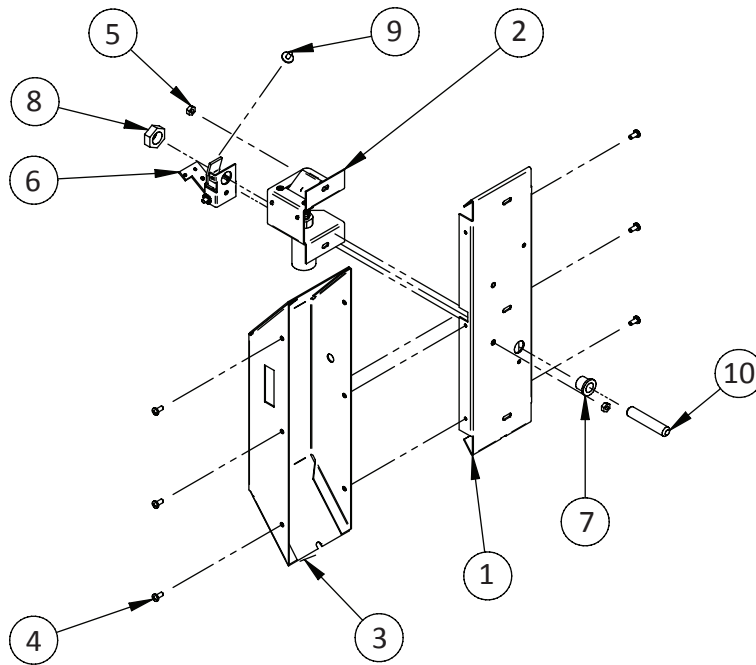
Lock Assembly and Associated Parts *(serial numbers beginning 201326RA00007 and after)*



Item No.	Description	Part No.
1	Health Timer Lock Assembly	397310
2	Insulated Pocket, Outer	926065
3	Vertical Panel Backer, Left, Full Length	397323
	Vertical Panel Backer, Left, Header Unit	397307
4	Insulated Pocket, Inner	926064
5	Emergency Release Button Panel Assy., Full Length <i>(includes the following five parts)</i>	397325
	Emergency Release Button Panel Assy., Header Unit <i>(includes the following five parts)</i>	397308

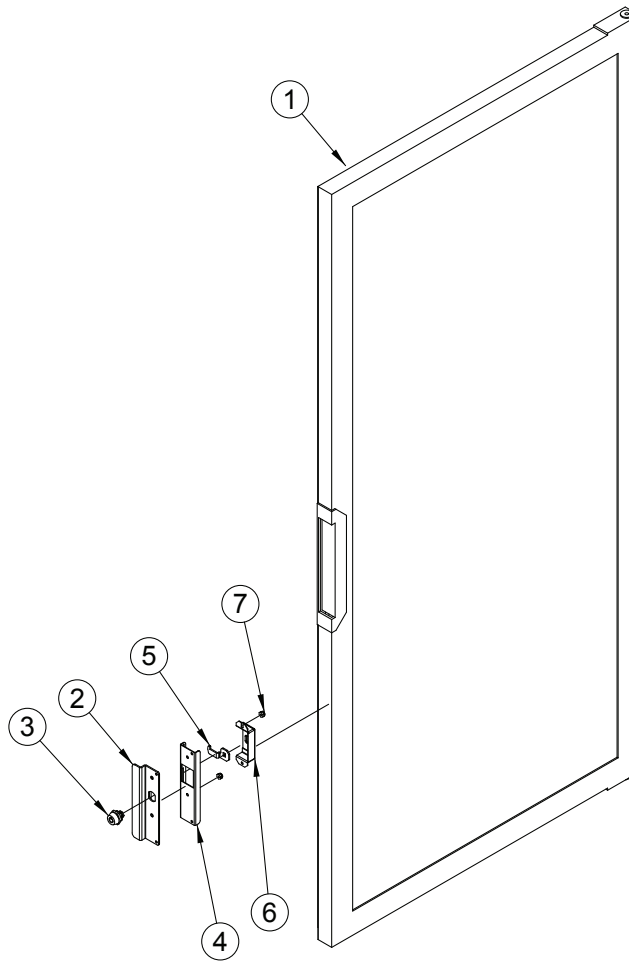
Item No.	Description	Part No.
•	Vertical Pnl. Cover, Left, Full Length	397322
	Vertical Pnl. Cover, Left, Header Unit	397302
•	Emergency Release Button	815793
•	Bushing	803030
•	Hex Jam Nut, 9/16"-18	905019
•	O-Ring	815809
6	Latch Strike Housing Subassembly	397205
7	Bottom Edge Guard	397303

Lock Assembly *(serial numbers beginning 201326RA00006 and before)*



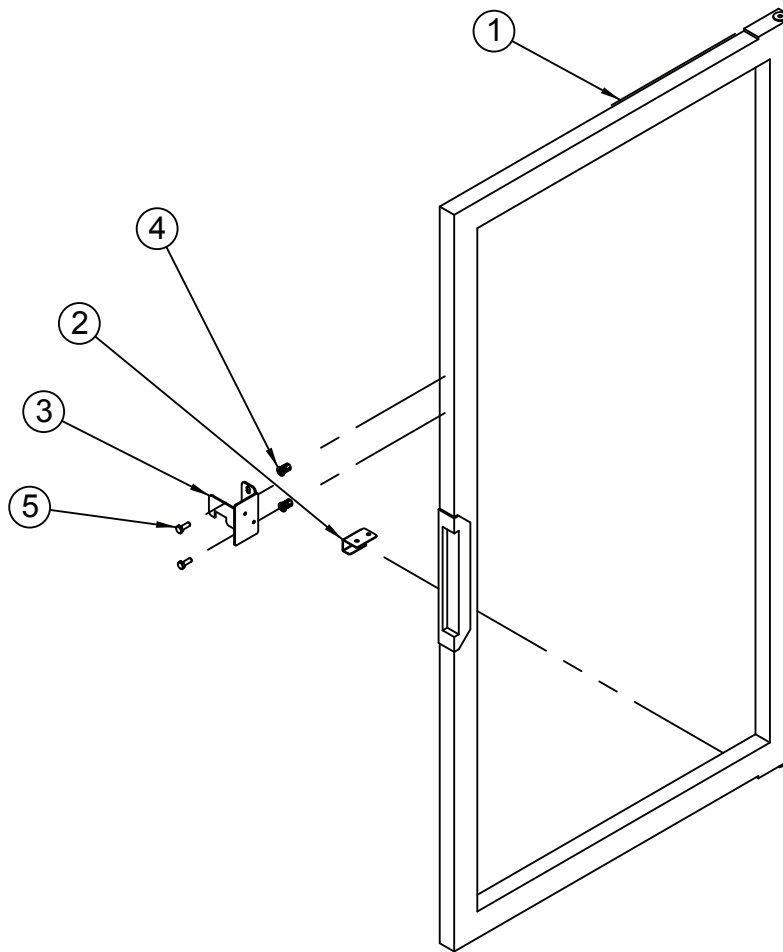
Item Number	Description	Part Number
•	Lock Assembly, RVC Health Safety <i>(includes items 1-10 below)</i>	370340
1	Mounting Bracket	370341
2	Solenoid Mechanism Assembly	370339
3	Solenoid Cover	370337
4	Screw, #8-32 x 3/8"	E901011
5	Keps Nut, #8-32	E905001
6	External Release Lever Assembly	370346
7	Bushing	803030
8	Hex Jam Nut, 9/16"-18	E905019
9	Screw, #8-32 x 3/8" Hex Head	E901063
10	Release Push Rod	370352
•	Internal Release Lever Assembly <i>(covers item 10 inside cabinet)</i>	370345
•	Cable Retainer <i>(covers harness to the Lock Assembly on the outside of the cabinet)</i>	370332

Door Assembly (serial numbers beginning 201326RA00007 and after)



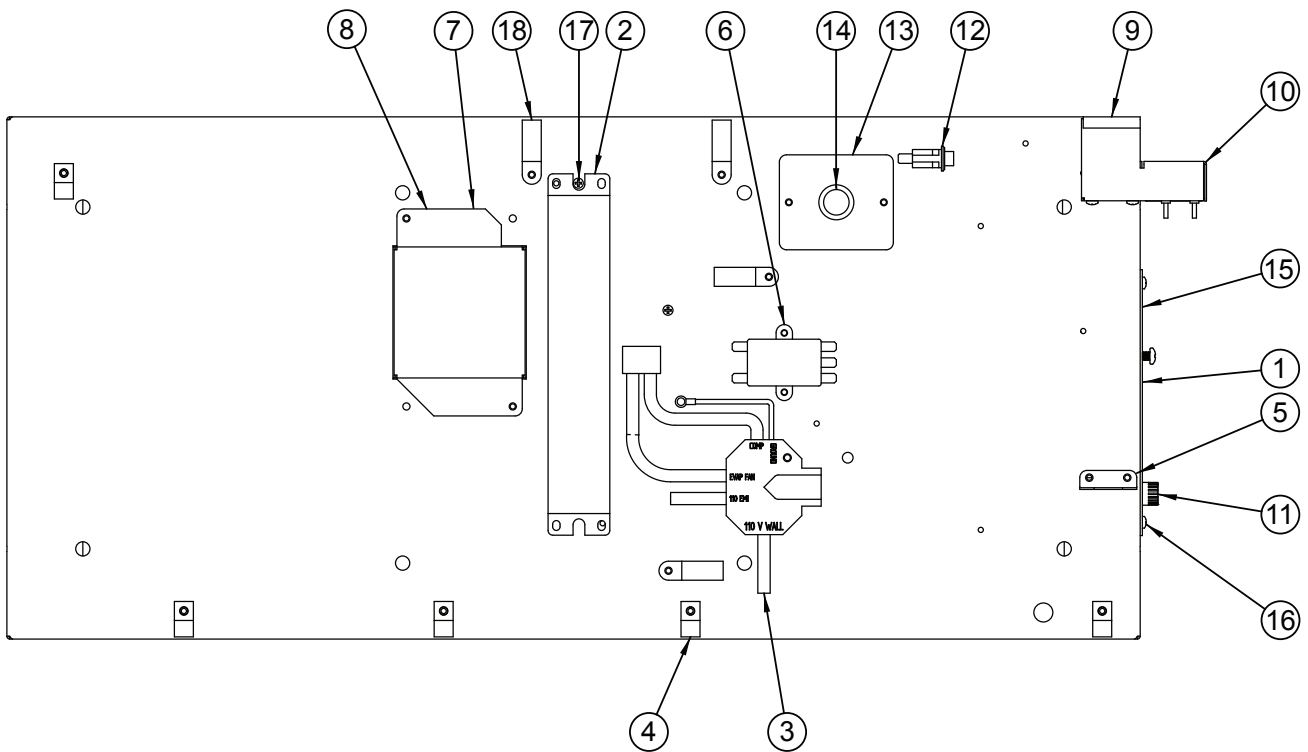
Item Number	Description	Part Number
•	Door Assembly, RVC Health Safety Ver. 2, Header Unit (includes items 1-7)	397500
•	Door Assembly, RVC Health Safety Ver. 2, Full Length (includes items 1-7)	397510
1	Cooler Door, Header Unit	849922
1	Cooler Door, Full Length	852061
•	Door Lock Assembly (includes items 2-7 below)	397100
2	Latch Protector	397115
3	Lock	812442
4	Lock Mounting Plate	397103
5	Lock Latch, Health Timer Cooler	397101
6	Lock Back Cover	370129
7	Stop Nut, #8-32	E905004
•	Door Handle	815781

Door Assembly (serial numbers beginning 201326RA00006 and before)



Item Number	Description	Part Number
•	Door Assembly, RVC Health Safety (includes items 1-5 below)	370502
1	Cooler Door	849922
2	Door Switch Strike	370500
3	Latch Assembly	370344
4	Molly Jack Nut, 1/4"-20	906088
5	Machine Screw, 1/4"-20 x 3/4", Hex Head, Black	901127
•	Door Handle	815781

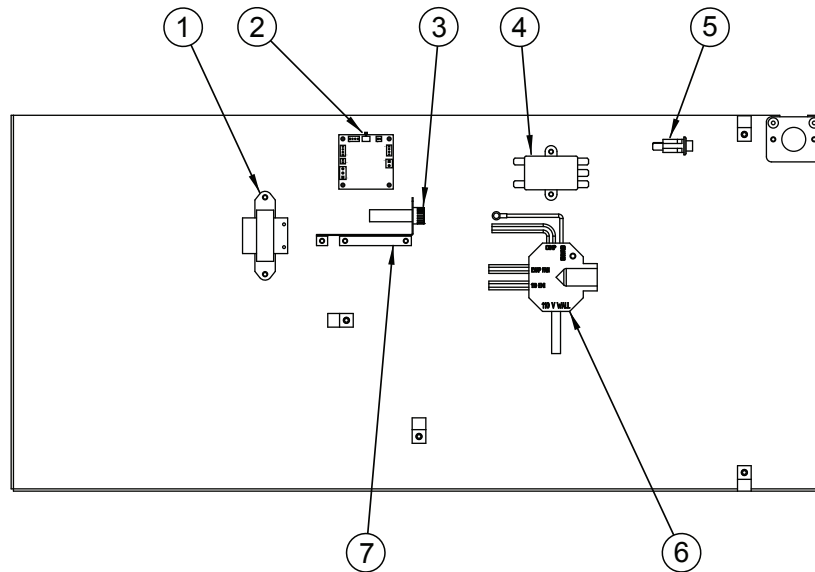
Lower Cabinet Parts *(serial numbers beginning 201326RA00007 and after)*



Item No.	Description	Part No.
1	Health Safety Controller	836255
2	Ballast, Advance	838036
	LED power supply	838057
3	Main Wiring Harness, Split	842767
4	Cable Clamp	E916014
5	Evaporator Box Guide Plate	370244
6	EMI Filter	842061
7	Transformer	838051
8	Transformer Cover	397218
9	Door Switch Base Bracket	370269
10	Door Switch Mounting Bracket	370270
11	Fuseholder Bracket	842531
•	Fuse, 1.0 Amp Slo-Blow	842766
12	Switch, On / Off	835027

Item No.	Description	Part No.
13	Wiring Cover	370237
14	Bushing	E916071
15	Health Timer Board Bracket Assembly	397217
16	Screw, #8-32 x 3/8"	E901011
17	Screw, #6-32 x 3/8"	901137
18	Cable Clamp, 1"	E916004
REFRIGERATION:		
•	Refrigeration Assembly, Health Safety, with Access Doors	370470
•	Refrigeration Control, Health Safety, RVCH-027	822088
•	Refrigeration Control, Health Safety, RVCH-010 / -012	822089

Lower Cabinet Parts *(serial numbers beginning 201326RA00006 and before)*



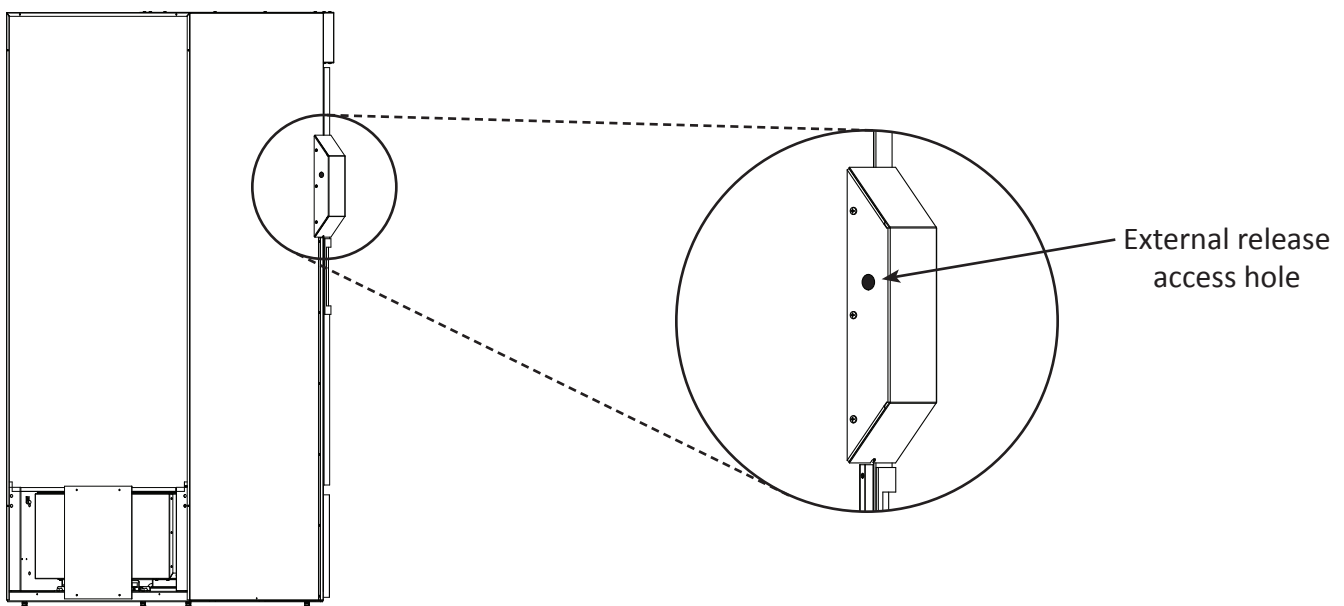
Item Number	Description	Part Number
1	Transformer	838051
2	Health Safety Controller	836255
•	Board Cover Assembly	370328
3	Fuseholder Assembly	842531
•	Fuse, 1.0 Amp Slo-Blow	842766
4	EMI Filter	842061
5	Switch, On / Off	835027
6	Main Wiring Harness	842596
7	Fuseholder Bracket	370331
HARNESING:		
•	Harness, Door Switch and Reset Button, Grille Side	842760
•	Harness, Door Switch and Reset Button, Cabinet Side	842761
•	Harness, EMI Filter to Transformer and Lights	842762
•	Harness, Health Safety Board Power to Fuse and Transformer	842763
•	Harness, Health Safety Board to Solenoid	842764
•	Solenoid Termination	842765
REFRIGERATION:		
•	Refrigeration Assembly, Health Safety, with Access Doors	370470
•	Refrigeration Control, Health Safety, RVCH-027	822088
•	Refrigeration Control, Health Safety, RVCH-010 / -012	822089

External and Internal Release of Door Lock (serial numbers beginning 201326RA00006 and before)

Both external and internal releases have been designed into the lock assembly. The following section outlines how to open the door using these releases.

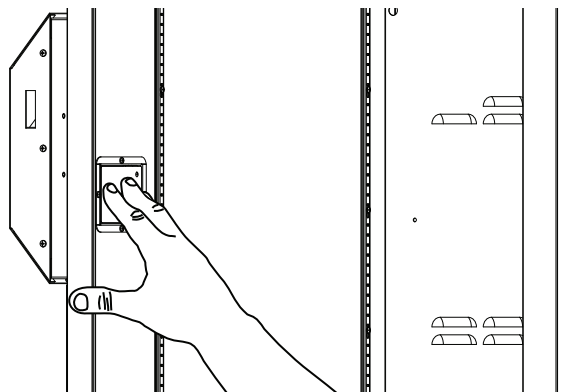
EXTERNAL RELEASE

The external release is intended for use when power is lost to the Cooler and access to the inside of the cabinet is necessary. To use the external release, insert a pencil or similar object into the access hole located on the back of the lock assembly, as shown in the following illustration. Angle the pencil upward, then push down to release the door from the lock.



INTERNAL RELEASE

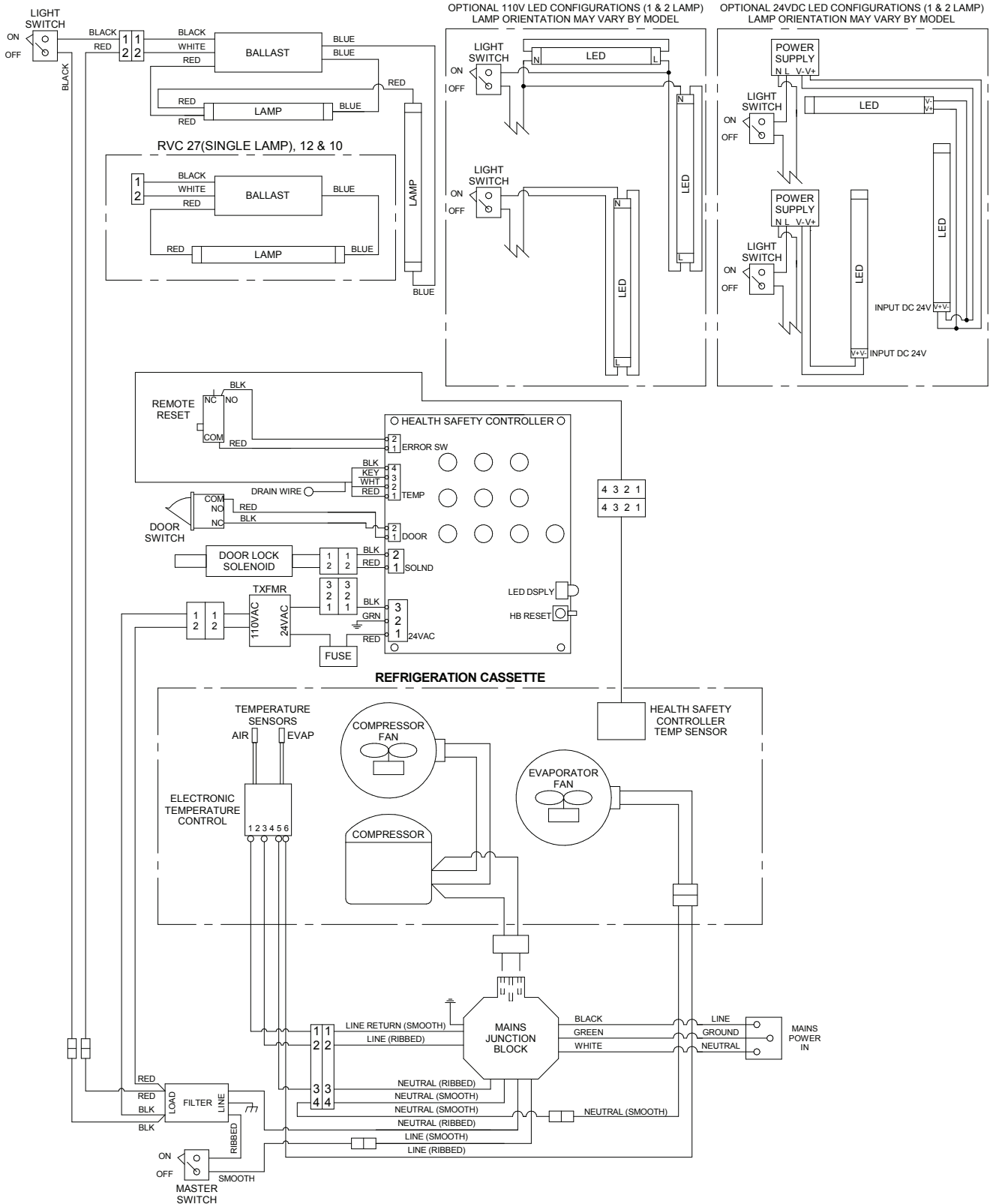
The internal release is used if a person becomes entrapped in the Cooler's cabinet and cannot open the door. To use the internal release, simply press the internal release lever, as shown in the following illustration. The lever is located inside the cabinet directly adjacent to the lock assembly.



Wiring Diagram

RVCH-027 with Health Safety Controller

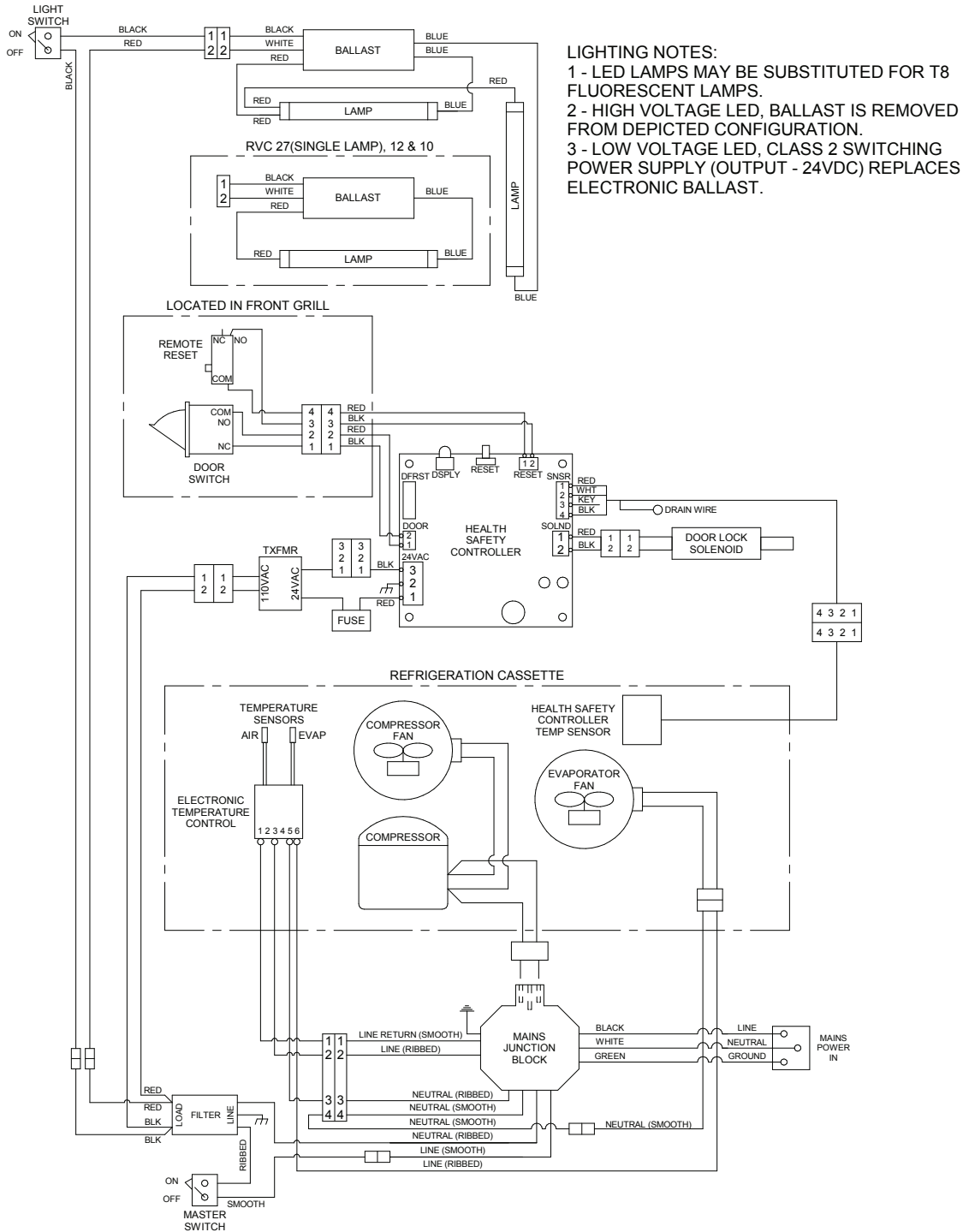
(serial numbers beginning with 201326RA00007 and after)



Wiring Diagram

RVCH-027 with Health Safety Controller

(serial numbers beginning with 201326RA00006 and before)



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