User Guide ems25*plus* MkII

Product overview

LED indicators

Green	Compressor The compressor LED is on while the compressor is running (cooling).
Red	Saving temperatures disabled If the LED is on, the product remains at the optimal serving temperature.
Red	Motion detection The motion LED flashes on detecting motion.

Buttons

Set
(Access the menus - Used by service technicians only)

Teach
(Starts a Teach period)

Up
(Cancels teach mode & Toggles summer/ winter mode when not in teach mode)

Down
(Also cancels alarms)

Power up sequence

Checks all the display segments are working


Displays the firmware version (Example)


Displays the checksum (Example)

Normal operation

During normal operation, EMS controllers display the information below. Assuming the product temperature is correct when the outlet is open, this means that the EMS controller is working correctly. If an alarm sounds and the EMS controller displays an alarm state, contact your service provider.


Ready mode
displays the word USE or the product temperature. The cooler lights are on. The product is at the optimal serving temperature, for example 4°C.

Saving mode
usually the cooler lights are off and the product temperature is allowed to rise to a predefined temperature.

Defrost mode
means the EMS controller has stopped the compressor and the evaporator fan is circulating air to prevent the build-up of ice on the evaporator.


Door open
indicates that cooler door is open. If the door is open for too long an alarm buzzer sounds and the display changes to  . Ensure that the door is closed properly.

Freeze up protection
if the appliance temperature falls too low, for example below 0°C, the EMS controller stops further cooling.

If evaporator frozen, ensure appliance sensor is connected properly. Disconnect appliance sensor and ensure display shows PF1. Otherwise, replace the controller.

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Cooler Thinking

Normal operation

Summer mode
(default setting) indicates that cooler is in summer mode. Summer mode has no effect on the operation of the controller.

Winter mode
indicates that cooler is in winter mode. Winter/Summer mode is changed by holding the UP button for 5 seconds. When in winter mode the controller should switch OFF the compressor at SP+OFS (SSP+OFS when in saving mode).

Teach Mode
enables outlet operators to put the controller into a one hour “off period” manually.

When the teach button pressed for 5 seconds the controller switches all the relays off for one hour (Light is exempt if OS = 1).

During the one hour, the motion detector input is disabled. Therefore, the controller does not detect motion.

Opening the cooler door or holding the up button for 5 seconds and then releasing, returns the controller to normal operation.

Note: This functionality aims to stop outlet operators switching off coolers.

Menu access

To access the menu:

1. Press and hold Set until PAS is displayed.
   - Press Set four times (x4).
   - Press Down twice (x2).
   - Press Up once (x1).
   - Press Teach twice (x2).
2. Ensure that PS is displayed.

Half reset

To clear the self-learning matrix and to restart the learning period:

1. Access the menu and press Down to scroll to the Hr menu.
2. Press Set and ensure that PAS is displayed
3. Re-enter the button sequence of the password:
   - Press Set four times (x4).
   - Press Down twice (x2).
   - Press Up once (x1).
   - Press Teach twice (x2).
4. Ensure that the controller reboots.

Test routine

Note: Tests depend on EMS type and configuration.

The ems25Plus may have:

- The evaporator fan enabled instead of the lights.
- The lights enabled instead of the evaporator fan.

To test the relays, temperature sensors, and motion sensor:

1. Access the menu and press Down once to scroll to the tst menu.
2. Press Set check displays shows 888.
3. Press Set and Teach together to start the relay test (rel). Then:
   - Press Down to test the evaporator fan – if enabled.
   - Press Up to test the lights – if enabled.
   - Press Set to test the compressor.
4. Press Teach to switch off relays that are on.
5. Press Set and Teach at the same time to test the analogue inputs (AnA). Then:
6. Press Up and then press Set to view the appliance sensor temperature.
7. Press teach to test the condenser input.
8. Press Down to test the door input.
9. Press Set and Teach at the same time to test the motion detector (Pir).
10. Press Teach and then wave hand in front of the motion sensor. Check that the displayed number increases.
11. Press Set and Teach at the same time to exit the test mode. The controller then reboots.

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Parameter set (controller order)		Parameter set (controller order)	
	Celsius (°C) or Fahrenheit (°F) sets the temperature scale.		Defrost termination temperature defines the temperature to end a defrost cycle.
 	Set Point temperature in Fahrenheit (SPF) or Celsius (SPC) sets the lower ready mode temperature (cut out temperature).		Fan set point (see Note) is the temperature that if exceeded results in the evaporator fan running continuously even if the door is opened.
	Differential is the temperature added to SP that sets the upper ready mode temperature (cut in temperature).		Condenser high temperature is the maximum permitted temperature measured in the refrigeration system. On reaching Ht, the controller disables the compressor and activates an alarm.
	Calibration 1 adds an offset to temperatures measured by the appliance sensor.		Winter Offset the value added as an offset to the set point & Saving set point, when the controller is set to winter mode via the UP button.
	Saving mode set point sets the lower saving mode temperature (cut out temperature).		Compressor rest time is the minimum time between compressor cycles.
	Saving differential is the temperature added to SSP that sets the upper saving mode temperature (cut in temperature).		Delay to saving is the delay in switching to saving mode from the ready mode.
	Uninterrupted pull down the compressor runs continuously until the set point is reached.		Light delay is the delay to switch off the cooler lights after switching to the saving mode.
	Freeze-up protection is the temperature to disable the compressor and enable the evaporator fan to prevent freeze up due to low temperature.		Saving restart is the maximum time allocated to lower the product temperature to the ready mode temperatures from the saving mode temperatures.

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Cooler Thinking

Parameter set (controller order)	
	Refrigeration system failure is the maximum continuous runtime of the compressor without reaching the set point temperature (cut out temperature).
	Defrost interval is the period between the end of a defrost cycle and beginning of the next defrost cycle.
	Defrost duration is the maximum time of a defrost cycle.
	Fan cycle on (see Note) is the active period of the evaporator fan while the compressor is off.
	Fan cycle off (see Note) is the inactive period of the evaporator fan while the compressor is off.
	Display stability sets the rate of change of the displayed temperature.
	Buzzer enable is the option to enable or disable a warning buzzer for alarm conditions. Does not affect door alarms.
	Buzzer duration for open door alarm conditions. After the buzzer duration, the controller switches off the compressor.

Parameter set (controller order)	
	Alarm delay is the maximum time a door can be open before sounding the alarm buzzer.
	Activity frequency is the minimum number of door openings or motion counts to indicate an active 30 minute period in the self-learning matrix.
	Sensor enable is the option to enable or disable the motion sensor input.
	Saving temperature disable is the option to maintain the ready mode temperature at all times.
	Learning period defines 1-day or 7-day learning period.
	Display is the option to display the temperature or the word USE.
	Output Select is the option to use the light relay as a fan relay (OS=2), or to keep the lights on at all times (OS=1), or to switch the lights off when the cooler is in saving mode (OS=0 - default setting).

Note:
Fan parameters will only be viewable if OS is set at 02

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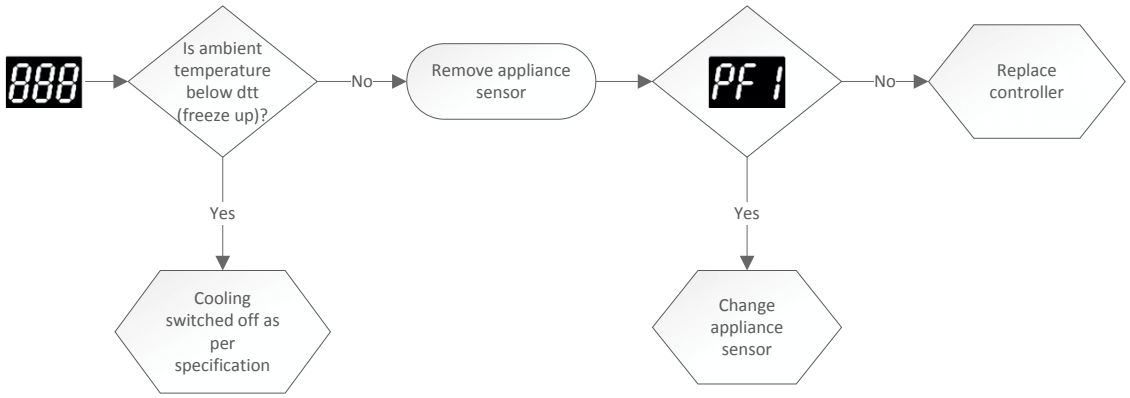
Alarms and troubleshooting

The EMS controller has several alarms that indicate problems. If an alarm sounds and the EMS controller displays any of the alarms below, please use the troubleshooting flowcharts provided to address the problem.

HI	Condenser high temperature means the temperature sensor on the condenser is reading a high temperature that usually indicates the condenser is blocked. If possible, press the Down button to clear the alarm.
dr	Door open alarm
PF1	Sensor failure indicates that a temperature sensor has failed. PF1 alarms means that the appliance temperature sensor in the refrigeration compartment has failed.
PF2	PF2 alarms means that the temperature sensor reading the condenser temperature has failed.
rSF	Refrigeration system failure see the Ct parameter for details. If possible, press the Down button to clear the alarm and wait ten minutes before ensuring that the cooler is working.
Cooler lights do not switch on	If EMS controller is in the ready mode, ensure that the light switch inside the cooler is switched on. Check that the lights are connected to EMS using the relay (rEL) test in the In-Code test routine.

Freeze-up protection



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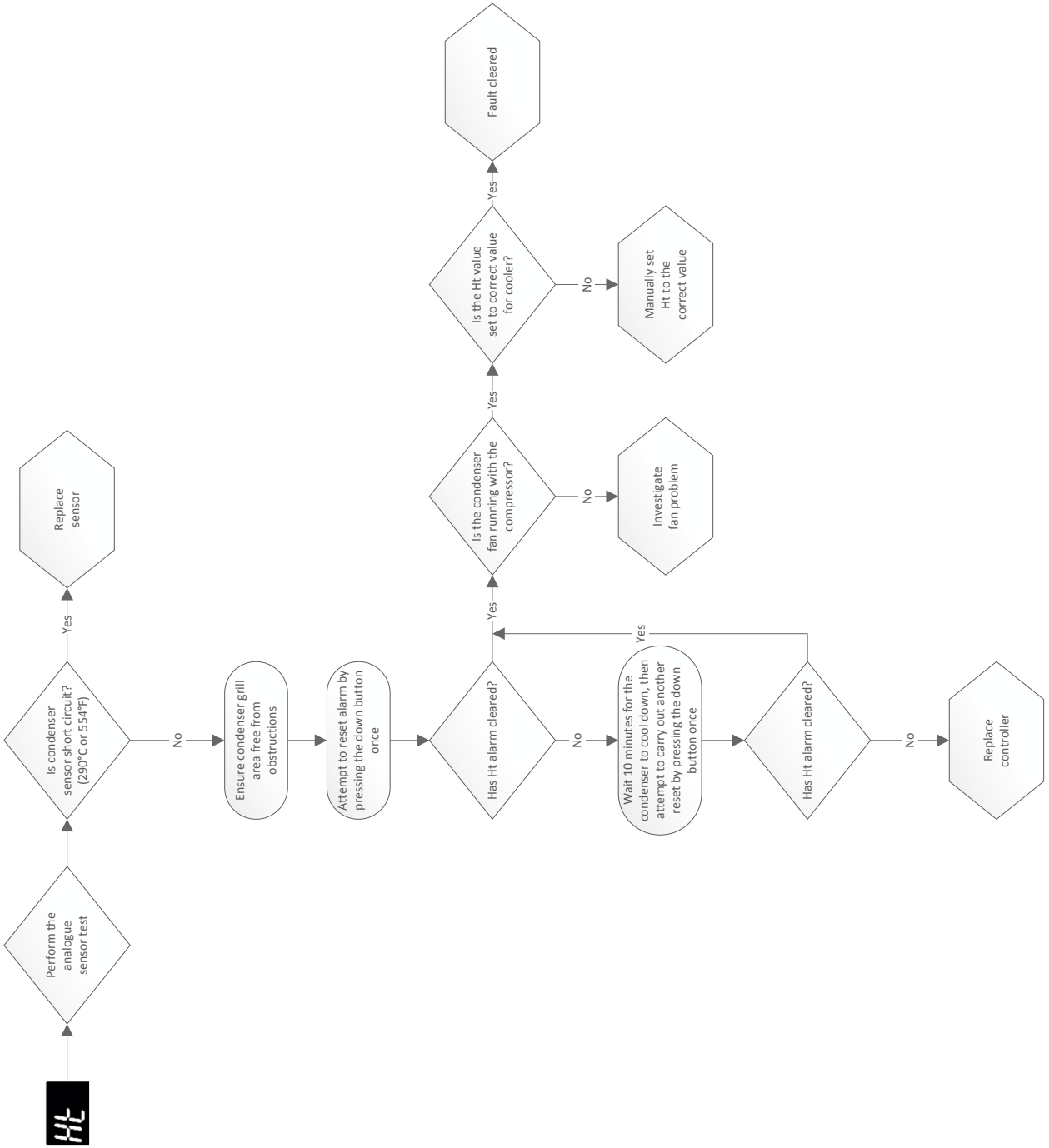
Condenser high temperature alarms



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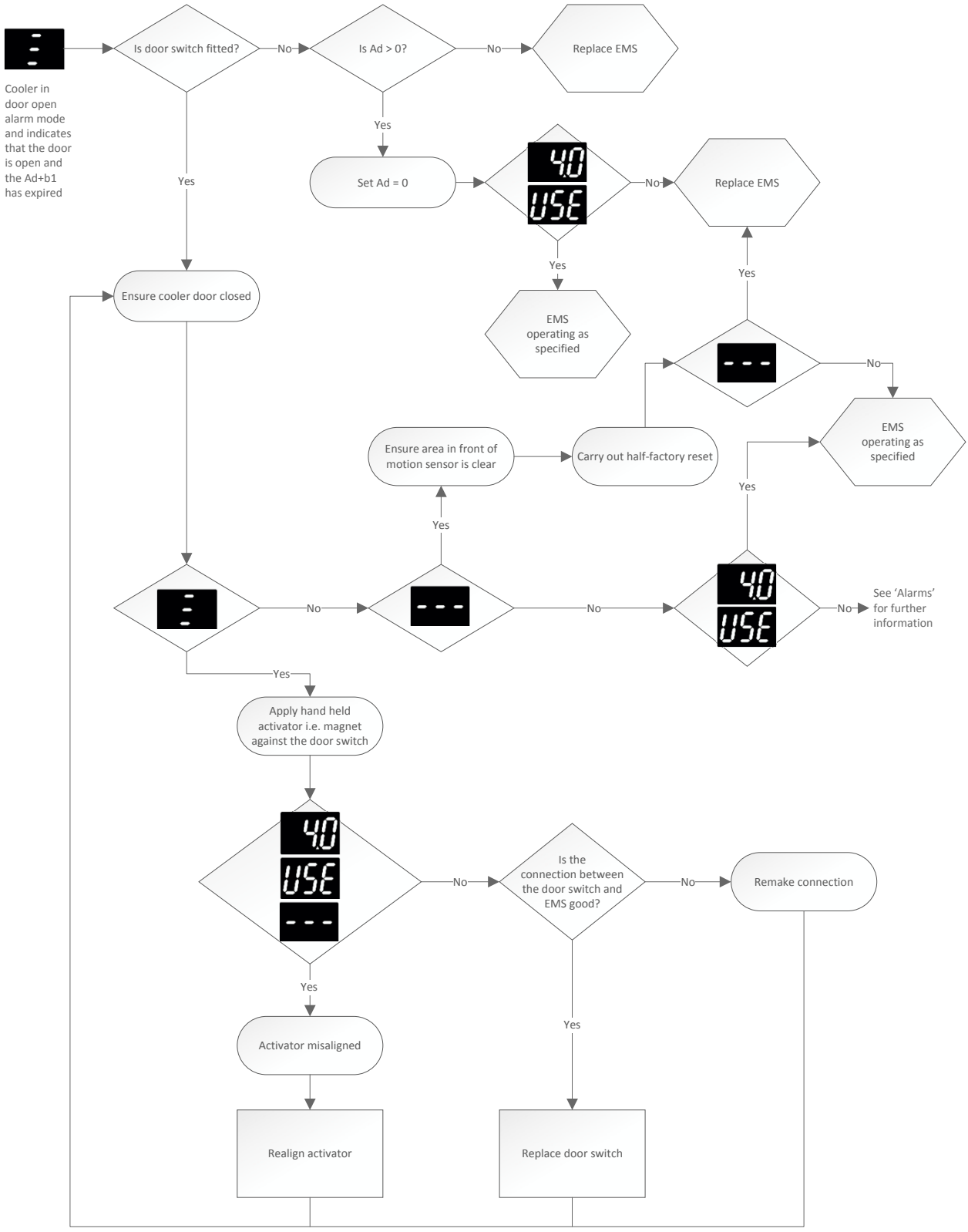
Door open alarms



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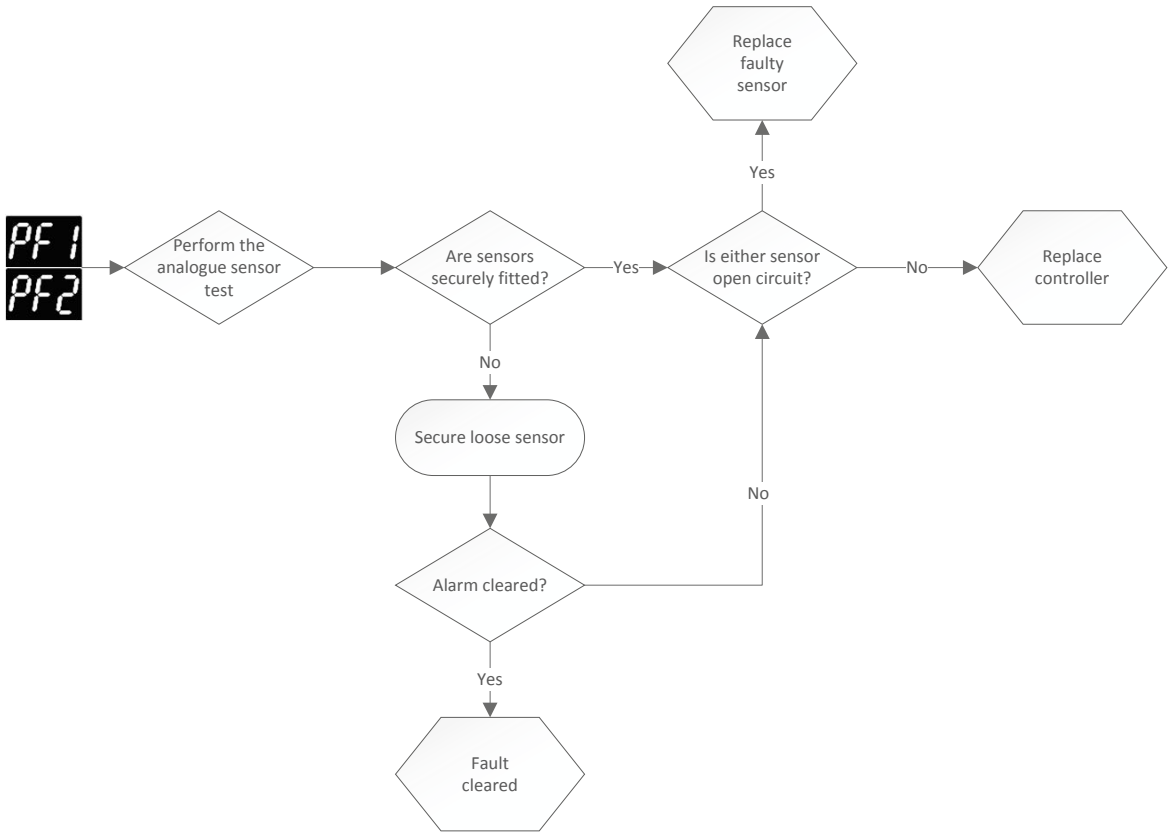
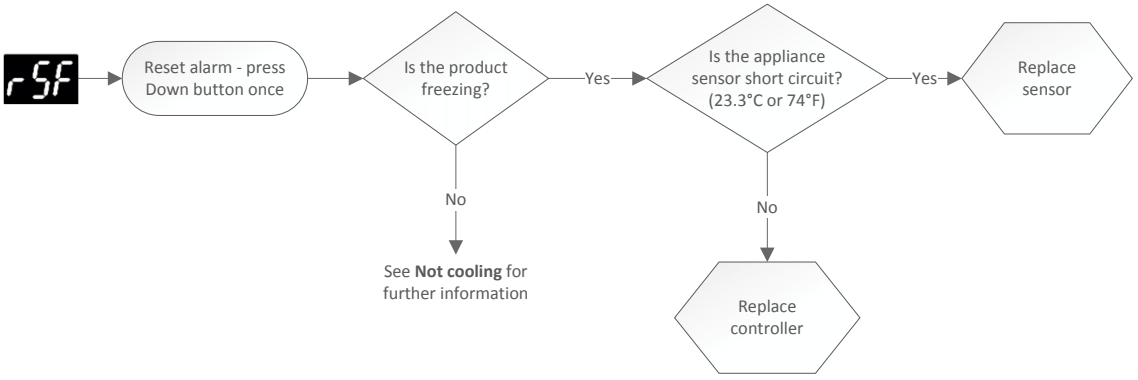
Temperature sensor alarms



Refrigeration system failure



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