

Scotsman[®]

Technical Review: The AutoSentry™ Ice System



The AutoSentry monitoring system constantly checks workload on gearbox shutting down system before a problem develops, preventing costly repairs. The electrical conductivity water sensor eliminates low or no water failures and cannot be affected by adverse water conditions

AutoSentry models include: FME804, FME1204, FME1504, FME2404, NME654, NME954, NME1254, NME1854, NSE654, NDE554, NDE654, and NDE754.

AutoSentry Technical Review

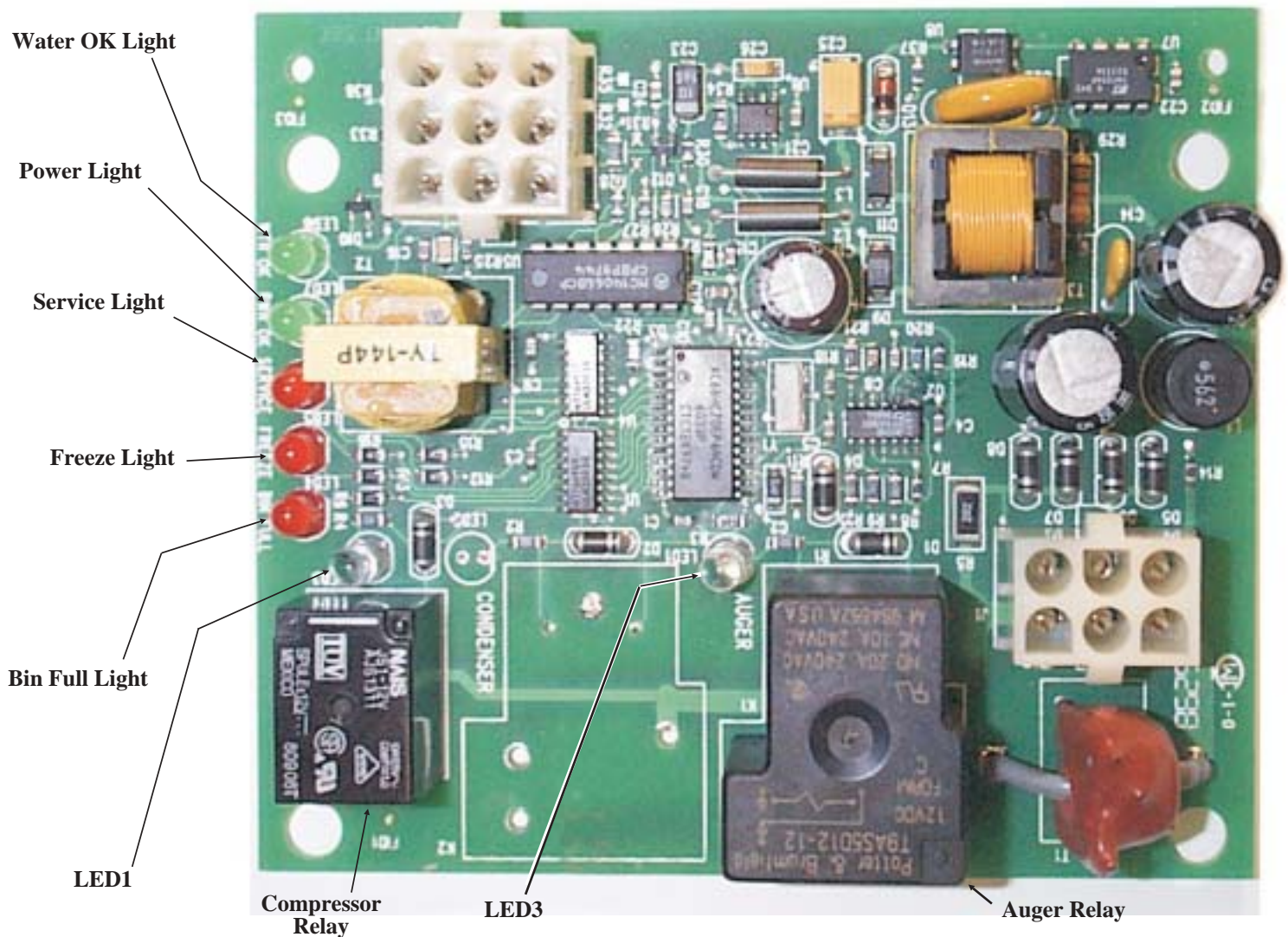
Control System

AutoSentry Control Board: Controls the ice machine through sensors and relays. The sensors are for ice level and water level. The relays are for the gear motor (with a built in time delay to clear the evaporator of ice when the unit turns off) and for the compressor.

There are 7 indicator lights on the control board:

- **WTR-OK.** Water OK. Normal = Glowing. Glows when there is water in the reservoir.
- **PWR-OK.** Power OK. Normal = Glowing. Glows when the control board has power **and** is functional.
- **Service.** Normally Off.
- **Freeze.** Normally Glowing when making ice.
- **Bin Full.** Normally Off when making ice.
- **LED1.** Normally Glowing when making ice.
- **LED3.** Normally Glowing when making ice.

Control Board

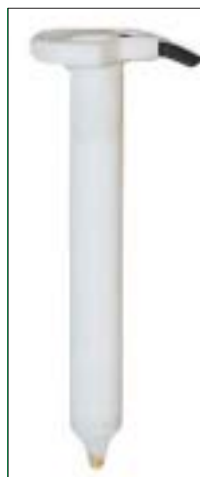


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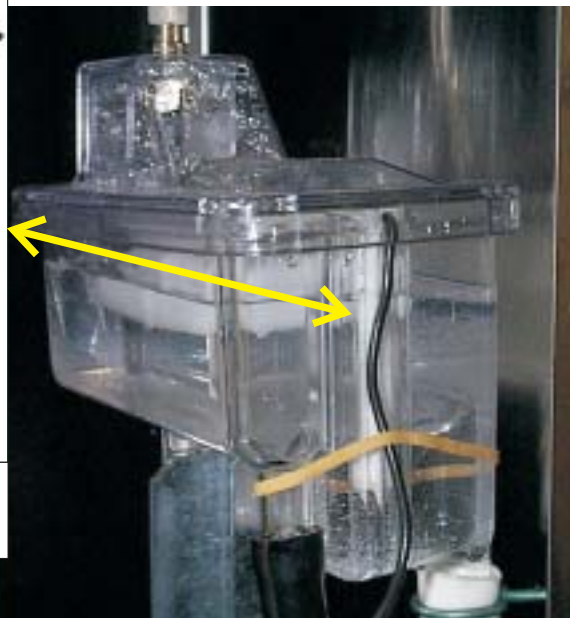
Control System

Water Sensor

- Conductivity probe located in the ice machine's water reservoir.
- Connected to the AutoSentry control board.
- Senses an electrical path from ground to the tip of the sensor.



Probe



Reservoir

Ice Sensor

- Photo-electric eye set
- Infrared light is emitted and when received ice making continues
- When the light path is interrupted ice making is shut down.



Ice Sensor Set

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Control Operation

Switching the mode switch to ON does the following:

- The PWR-OK light glows.
- If there is water in the reservoir the WTR-OK light glows.
- After 10 seconds the Freeze, LED1 and LED3 lights glow and the machine starts up.

Start Up:

- The compressor relay and auger motor relay become energized, connecting power to the windings of the auger motor and contactor coil.
- The contactor is energized, connects power to the compressor, and the compressor starts.
- During normal operation ice passes between the ice level sensors but only interrupts their infrared beam momentarily. The bin full light remains off and the machine stays on until ice builds up in the bin and blocks the path between the sensors for 6 seconds or longer. When that occurs the bin full light glows and the machine shuts down.

Shut Down:

- The compressor relay opens, LED1 goes out.
- The compressor contactor opens
- The compressor stops
- The auger motor stays on for 1 more minute, clearing out ice in the evaporator, and then
- The auger motor relay opens, LED3 goes out and the auger motor stops.

The compressor will not restart until 2 minutes or more have passed after the last shut down.

If the path between the ice level sensors remains clear for more than 10 seconds the ice machine will restart.

Another purpose of the control board is to turn the machine off when necessary:

- When the water level in the reservoir falls below the water level sensor's tip, the WTR-OK light goes out and the machine shuts down. When water refills the reservoir the WTR-OK light glows and the machine starts up again.
- If the auger drive motor current becomes excessive the compressor and auger drive motor will be switched Off and the Service light will blink. The control board will restart the auger drive motor in 4 minutes.

If during the first 60 seconds after restart the auger motor current stays within limits, the compressor is restarted and the machine returns to normal operation. If the current is excessive within 60 seconds after the restart, the process will be repeated once more. If after that try the current is still excessive the machine shuts down and must be manually reset. The service light will then be glowing continuously.

To Reset: Disconnect and reconnect electrical power

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Cut Out Switches

Separate from the circuit board:

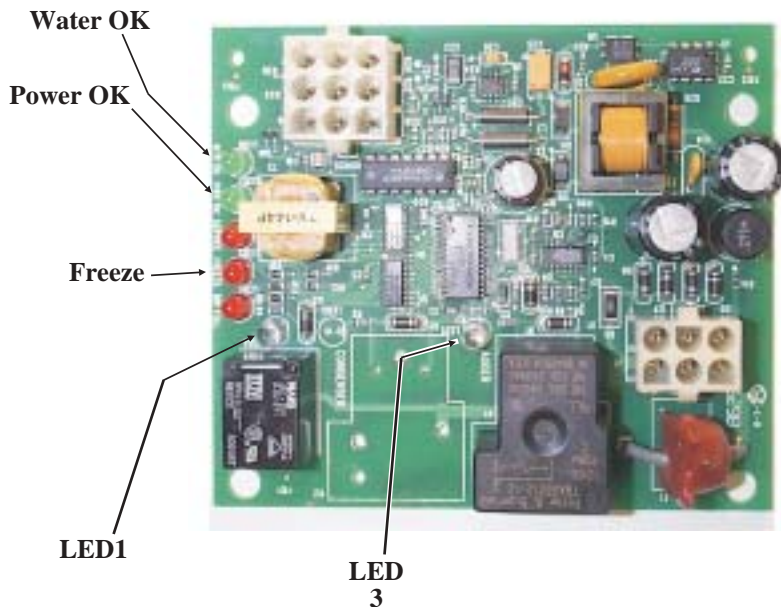
- If the high pressure cut out switch opens the machine will stop immediately. It will automatically reset when the pressure falls below its cut in point.
- If the low pressure cut out switch opens the machine will stop immediately. It will automatically reset when the pressure rises above its cut in point.



Low and High Pressure Cut Out Switches

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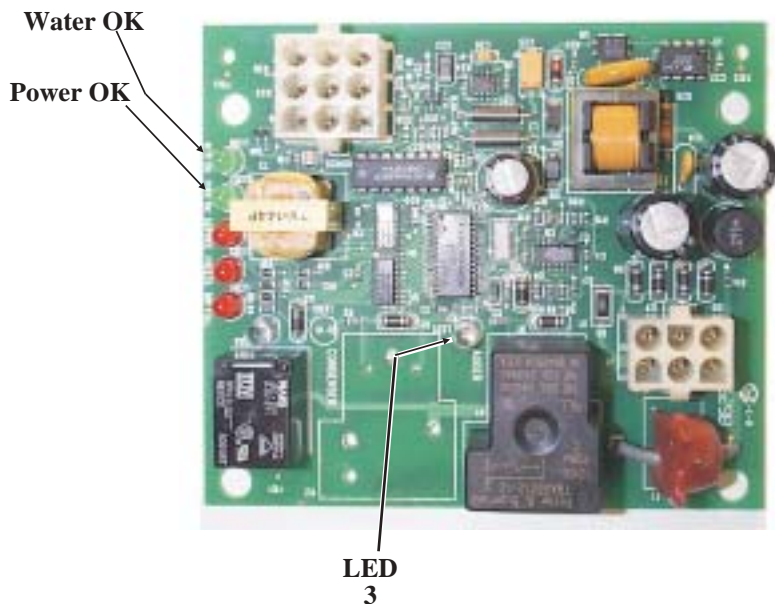
Control Board: Making Ice



Indicator Lights

- Water OK will be Glowing
- Power OK will be Glowing
- Freeze light blinks during 2 minute Restart Delay.
- Freeze light glows steady while the unit is making ice.
- LEDs 1 and 2 will be glowing

Control Board: No Water

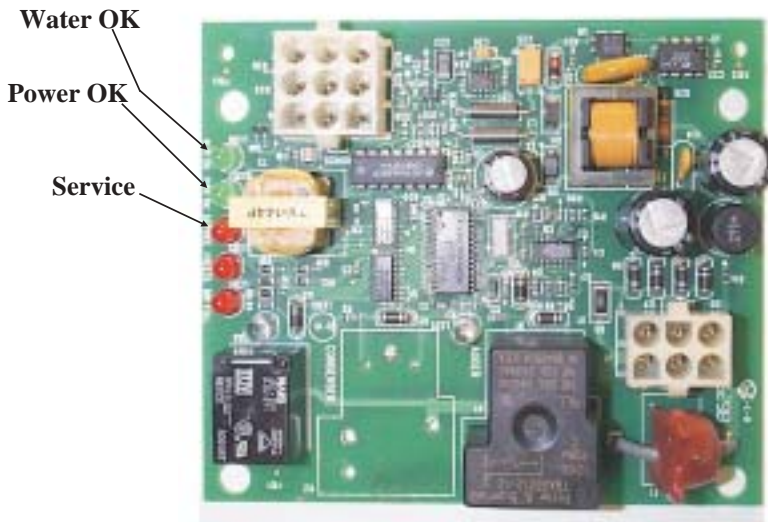


Indicator Lights

- Water OK Blinks Until Auger Motor Shuts Off.
- Then it and LED3 Are OFF
- Only the Power OK light will be glowing

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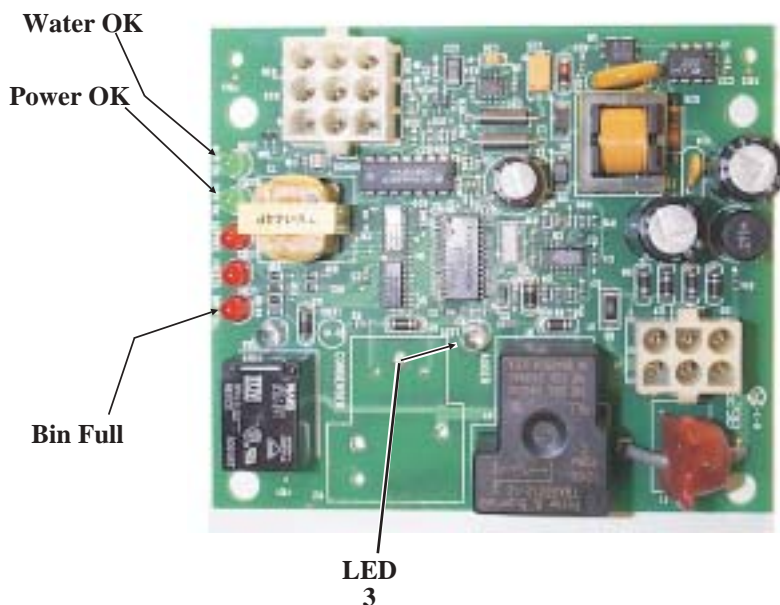
Control Board: Auger Motor Stalled



Indicator Lights

- Water OK will be glowing
- Power OK will be glowing
- Service Light Blinks During the Restart Period
- Glows Continuously When Board Must be Manually Reset

Control Board: Bin Full



Indicator Lights

- Water OK will be glowing
- Power OK will be glowing
- Bin Full Blinks Until the Auger Motor Shuts OFF.
- Then Bin Full is ON and LED 3 is OFF

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Controller Diagnostic Chart

Indicator Light	Light is ON	Light is Blinking	Light is OFF
WTR-OK	Water in reservoir	Shutting down due to No Water	No water in reservoir
PWR-OK	Power to controller AND controller functional	Controller malfunction	No power to controller OR controller failed
Service	Restart failed ¹	Attempting restart ²	Normal operation
Freeze	In ice making mode	Waiting to start ³	Not in ice making mode
Bin Full	Ice sensors blocked ⁴	Shutting down due to a Full Bin	Bin is not full
LED1 or LED3	Relay coil powered	-	Relay coil not powered

1. Auger motor current was excessive on successive restart attempts.
2. Auger motor current is excessive but restart sequence has not been completed.
3. Compressor must be off for at least 2 minutes before the controller will restart it.
4. Ice sensors must be blocked for at least 6 seconds before the bin is assumed to be full.