

Installation & Operation Manual

ChromaRG

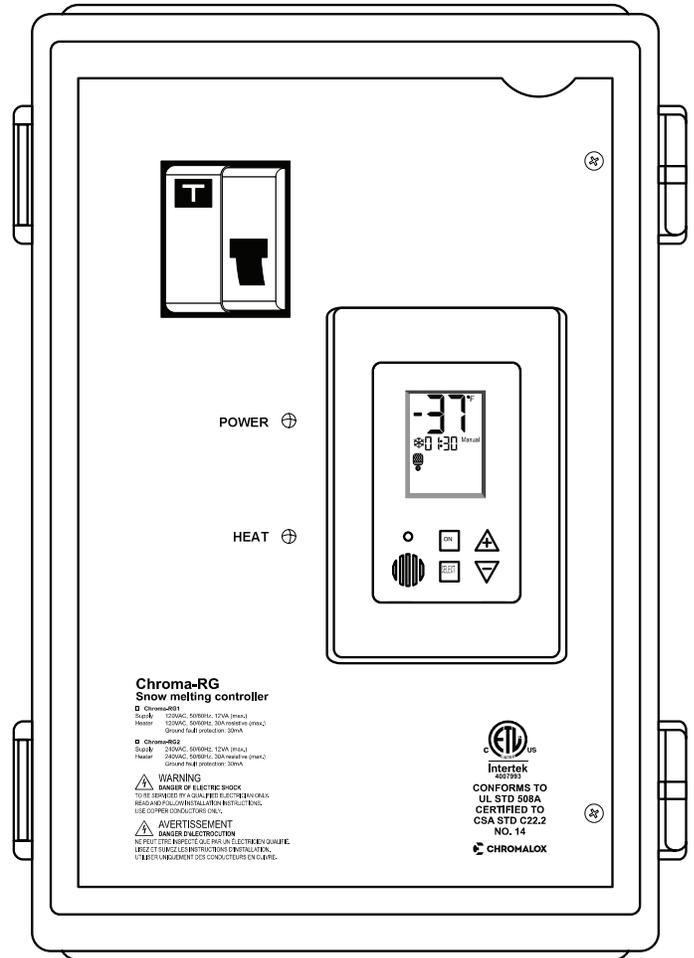


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Safety Precautions

IMPORTANT SAFEGUARDS



Safety precautions should always be followed to reduce the risk of fire, electrical shock, injury and even death to persons.

Please read all instructions before operating the Control Panel.



To avoid electrical shock or injury, always remove power before servicing a circuit. Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Contact an area supervisor or safety personnel for more information.

⚠ WARNING



HIGH VOLTAGE is used in the operation of this equipment; DEATH ON CONTACT may result if personnel fail to observe safety precautions.

Learn the areas containing high-voltage connections when installing or operating this equipment.

Be careful not to contact high-voltage connections when installing or operating this equipment.

Before working inside the equipment, turn power off and ground all points of high potential before touching them.

⚠ WARNING



ELECTRIC SHOCK HAZARD. Any installation involving control equipment must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

Before Powering Up

Chromalox takes great pride in knowing that we have provided to you a product of premium quality and workmanship. We have taken every precaution to ensure that your equipment arrives safe and secure.

However, vibration and temperature changes during shipping can cause some components to become loose. Additionally, throughout the life span of this product, other environmental and application conditions may have affected the mechanical and electrical continuity of several internal components. Therefore, for your safety and overall product performance, please take the time to familiarize yourself with the **MAINTENANCE, OPERATION, AND INSTALLATION INSTRUCTIONS** technical manual that was shipped with your panel.

Since it is not uncommon for electrical wiring and mechanical connections to become slightly loosened during shipment, we ask that you pay particular attention to the section titled Wiring and Connections:

WIRING AND CONNECTIONS



Check wiring and connections as follows:

- a. Inspect wiring for wear, fraying, chipping, nicks, and evidence of overheating. Repair minor defects with a good grade of electrical tape, or replace if needed.
- b. Inspect for loose electrical and mechanical connections. Tighten or replace defective crimp-style lugs. Re-solder loose solder connections. Tighten or replace all loose or missing hardware.

Introduction

The Chroma-RG power boxes together with the Controller and User Interface panel, offer smart and easy control over the Chroma Snow & Ice Melting system.

It can operate one snow melting zone.

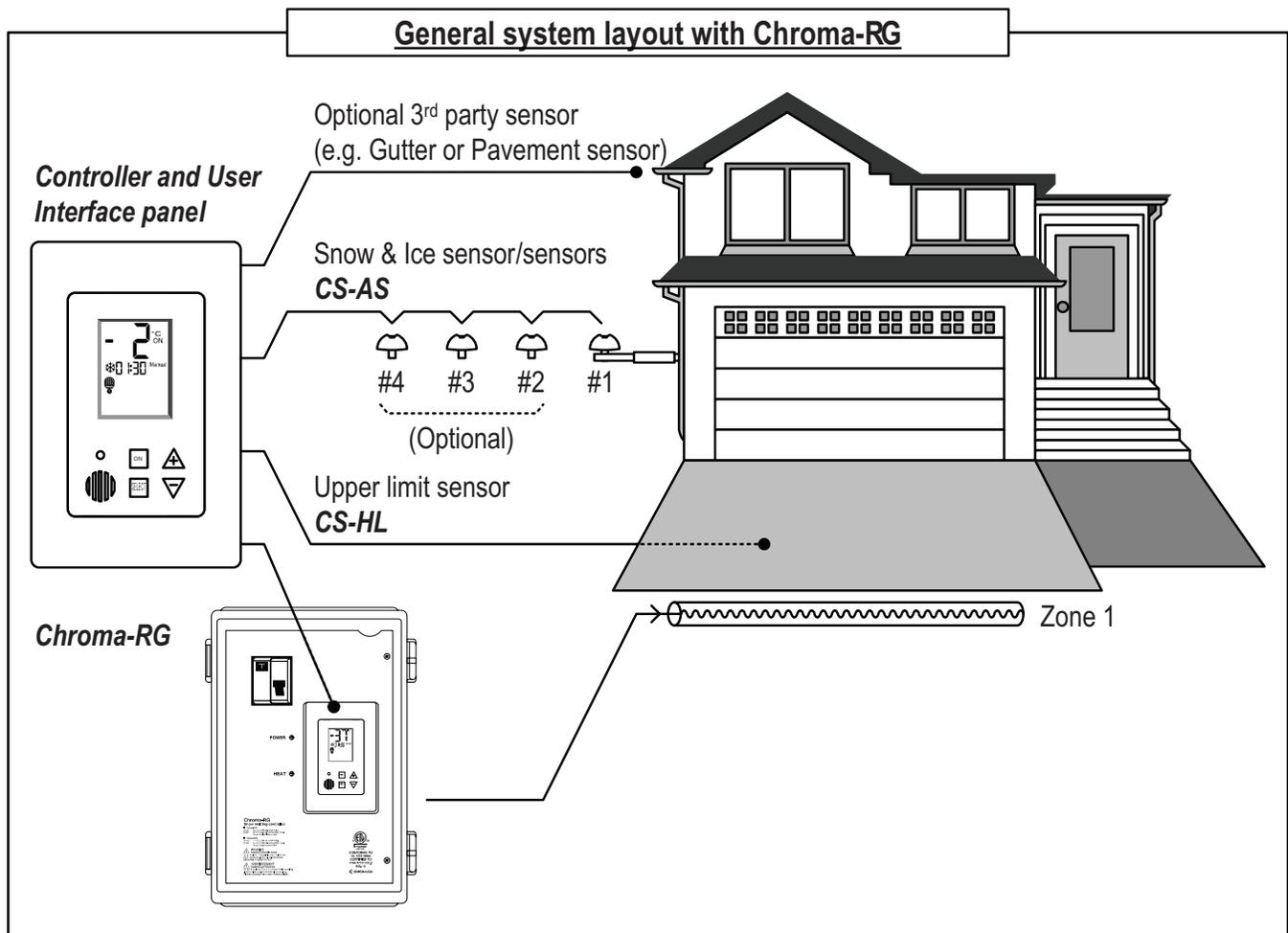
Typical applications include driveways, sidewalks, loading docks, stairs, pavements and gutters.

The backlit LCD screen provides full interface and information of the system status.

The use of several zones staggering allow covering larger area for snow melting with a limited available electrical power.

The interface panel offers various operating and programming options such as:

- Switchable temperature scales (°F or °C)
- Both Automatic and Manual modes
- Adjustable heater hold on, off & delay
- Optional auxiliary control by 3rd party snow sensor (e.g. Gutter sensor)
- Adjustable Lower ambient temperature limit to stop heater (lockout)
- Energy saving upper temperature limit
- Adjustable snow sensor sensitivity (%Rh)
- Commissioning/Test mode



Chroma-RG Series Installation

PLEASE READ THIS MANUAL AND THE SAFETY WARNINGS CAREFULLY BEFORE INSTALLING AND USING THE CONTROLLER AND SAVE IT FOR FUTURE USE.

Installation notes

1. Familiarize yourself with the markings, warnings, components and terminology.
2. The Chroma-RG power boxes and its accessories must be installed by a qualified electrician in accordance with local regulations and the requirements of the NEC (NFPA 72) and the CEC part 1.
3. **Installer must ensure the installation of approved disconnect means, for all power supply circuits feeding this unit.**
4. The power boxes are suitable for indoor wall mount installation only.
5. Ensure wiring according to the provided schematics using copper conductors only.
6. Make sure the wire gauge (AWG) is suitable for the circuit amperage draw, as specified in the NEC/CEC table 1.
7. Ensure that the main breakers (fuses) are suitable for the heating systems rating (80% load).
8. Grounding means must comply with local regulations and CEC/NEC.
9. Ensure that the heating system/de-icing system connected to this unit complies with the UL 499 or UL 515 & CSA 22.2 # 130.3 standard and is certified / listed by an NRTL.
10. Ensure that all wiring is rated for the application at 60°C (140°F as per UL 515 CSA 22.2 #130 clause 12 table 12.1.
11. Ensure that any holes punched for conduit are to compromise the integrity of the enclosure ratings.

⚠ WARNING

Ensure the power is disconnect from all circuits before mounting the power box and making any connections. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

Ground Fault Equipment Protector (GFEP)

1. The GFEP installed in this system is a Non class A GFCI, intended for equipment protection.
2. Familiar yourself with its operation and required setting.
3. The internal GFEP circuit breaker should be tested monthly. Please refer to the GFEP testing instructions section in this manual.

Wiring the Chroma-RG

Main supply for the power box

Provide terminals L1, N1 with 120 or 240 VAC supply (model dependent).

CAUTION

Incorrect voltage may cause fire or seriously damage the unit.

Connection to 3rd party ice/snow sensor (GIT-1 / CIT-1 / SIT/6E) - option

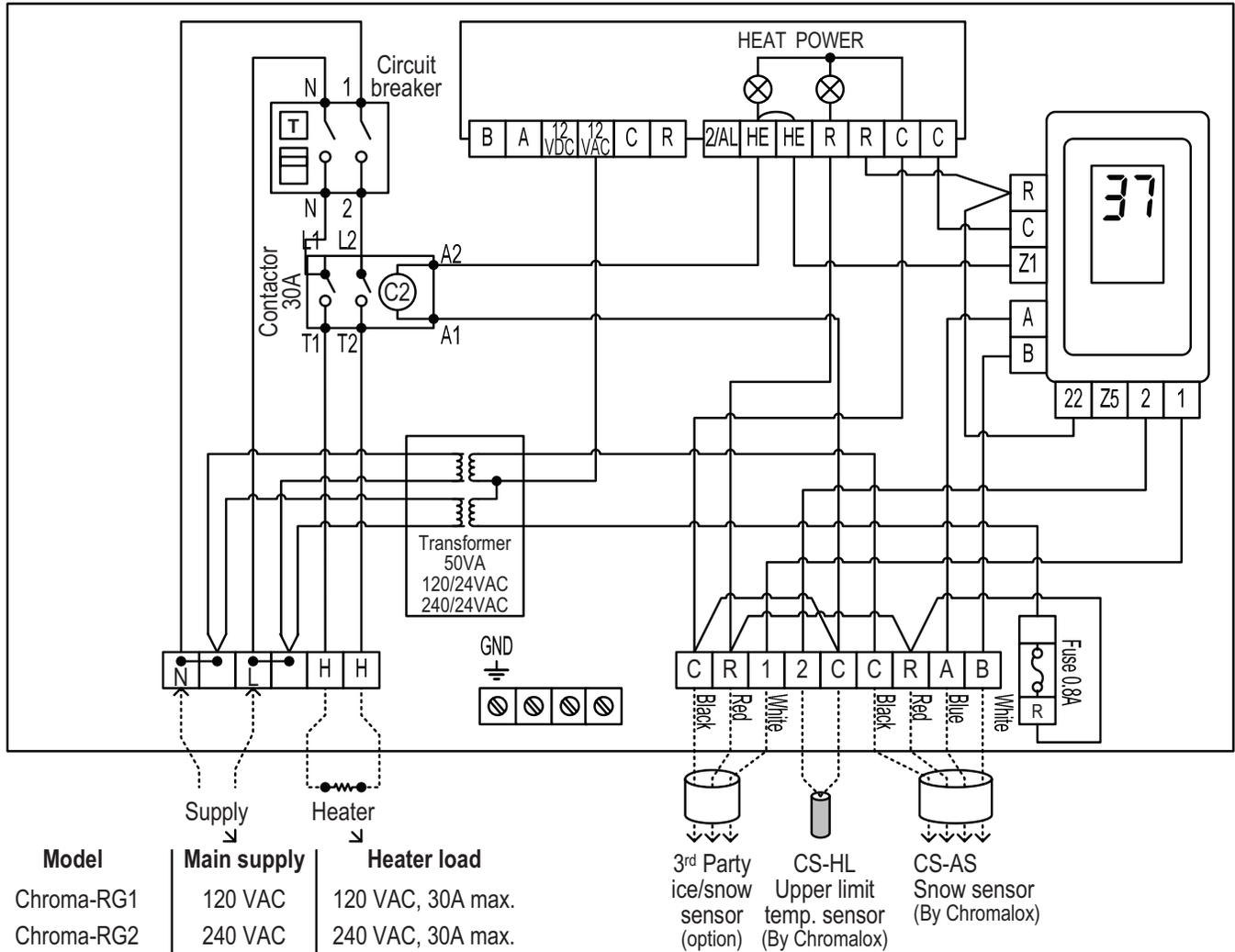
3-wire shielded cable

Up to 2,000 ft (609 m) using 12 AWG 3-wire shielded cable.

Up to 500 ft (152 m) using 18 AWG 3-wire shielded cable.

Connection to snow sensor (CS-AS)

Please refer CS-AS installation section of this manual.



Connecting Snow Sensors to the System

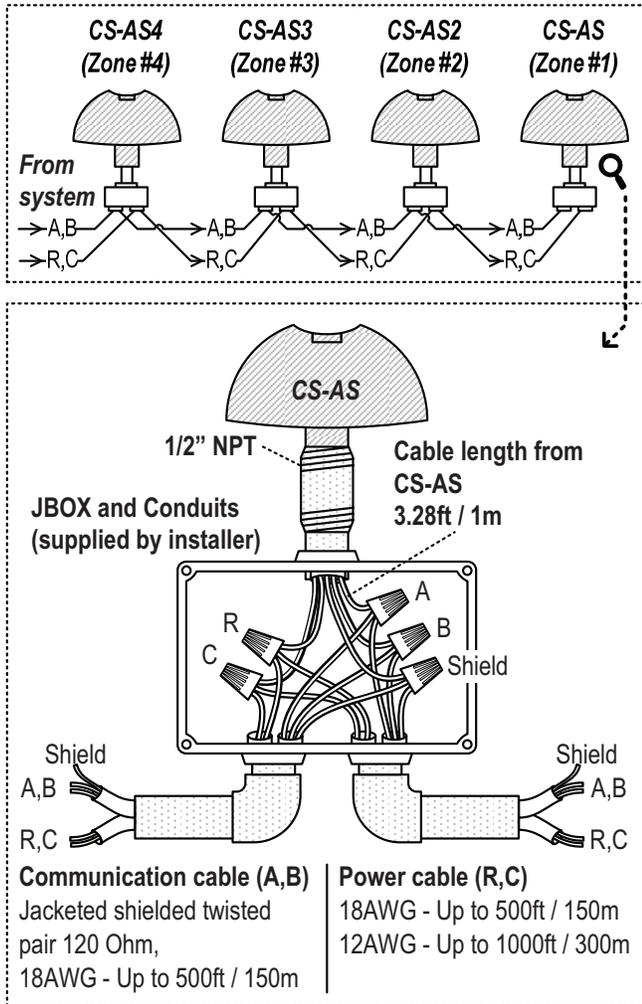
The system can be configured to operate with 1, 2, 3 or 4 snow sensors.

Each snow sensors must have different MAC address in order to communicate with the main board.

The CS-AS snow sensors series includes 4 different part numbers, each is factory pre-configured with unique MAC address as follows:

- CS-AS MAC Address 1
- CS-AS2 MAC Address 2
- CS-AS3 MAC Address 3
- CS-AS4 MAC Address 4

IMPORTANT! When connecting more than one sensor, snow sensor 1 must be connected last in communication line.



Notes:

- The number of snow sensors connected must be configured in section P09 of the technician settings.
- When one of the snow sensors cannot be viewed through communication (faulty or not connected), the values on snow sensor 1 will be used instead.

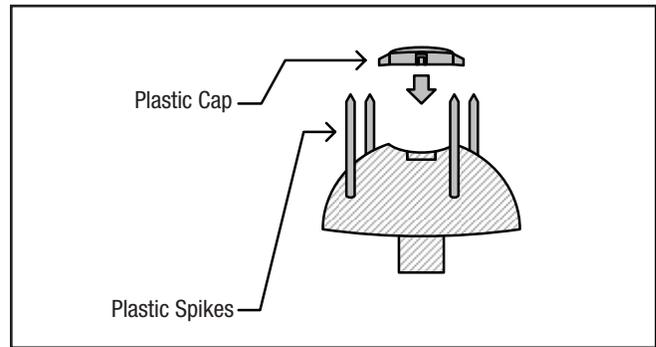
The CS-AS is supplied with:

1. A plastic cap, to protect the sensor from dust and debris for when the sensor is not in use (off season).

IMPORTANT! The protective cap must be removed before use of the sensor.

If the protective cap is not removed, the sensor will not detect snow!

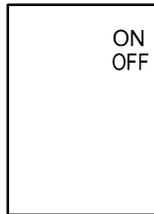
2. Plastic spikes, to be used if necessary, to keep birds off the sensor.



Operating Instructions

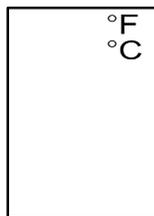
Turning the System ON and OFF

1. Press and hold the [ON] button for 0.5 seconds to turn the system ON or OFF.
2. The words “ON” or “OFF” will appear on display.
3. When ON, the green LED on the front panel will also turn ON .



Selecting Temperature Scale

1. Press the [+] button for Celsius.
2. Press the [-] button for Fahrenheit.



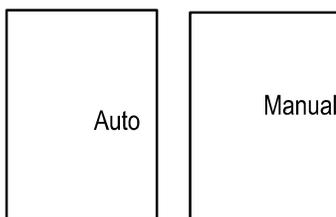
Selecting Automatic or Manual Mode

1. Press the [SELECT] button to switch between modes:

“Automatic” Heating will start and stop automatically depending on the set point and ambient temperatures.

“Manual ON” Heating will start regardless of the set point and ambient temperatures and will stop after a preset time (pls. refer to the “Manual ON” section in the tech. settings).

NOTE: Mode will always return to “Automatic” after switching the unit OFF and ON.



Heater Indication

Black icon – Heater ON

White icon – Heater OFF



Heater ON



Heater OFF

When ON, the red LED on the front panel indicating heater operation will also turn ON .

Snow Flake Icon and Digital Time Indication

A solid snow flake icon will appear on display during normal heater operation.



A blinking snow flake icon will appear on display during heater off delay or when manual mode is activated. The digital clock will count down the remaining time until the heater is turned off.

The snow flake icon will disappear from display as long as the heater is turned off.

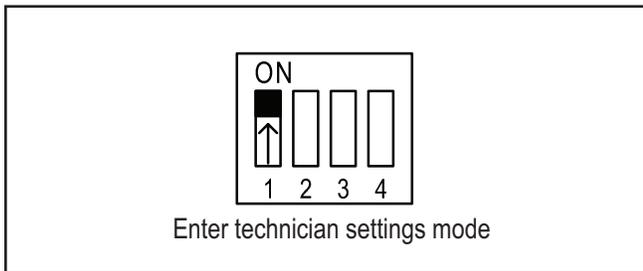
Technician Settings

P01	Temperature set point
P02	Lower ambient temperature limit to stop heater
P03	Energy saving, upper slab temperature limit to stop heater
P04	Time delay before stopping the heater
P05	ON time for manual mode
P06	Not in use

P07	Not in use
P08	Snow sensor sensitivity
P88	Snow detection threshold
P09	Number of snow sensors connected
P10	Commissioning / Test mode
Restore defaults	

Enter Technician Settings Mode

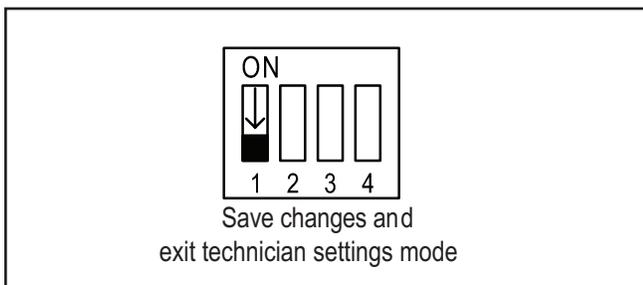
1. Move DIP switch S1 located on the side of thermostat to ON position.
2. Press the [SELECT] and [+] buttons simultaneously to move forward to the next technician parameter.
3. Press the [SELECT] and [-] buttons simultaneously to return to the previous technician parameter.



Save Changes and Exit Technician Settings Mode

1. Move DIP switch S1 located on the side of thermostat to OFF position.

IMPORTANT: Changes made to technician parameters will not take effect as long as DIP switch S1 is in ON position.



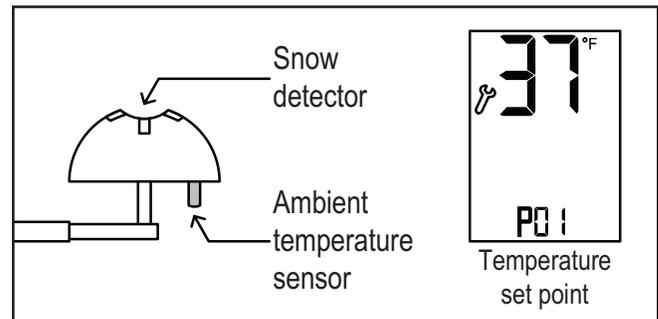
Parameters:

P01 - Temperature set point

1. Move DIP switch S1 located on the side of thermostat to ON position to enter technician settings mode.
2. "P01" and the temperature set point will appear on display.
3. Use the [+] and [-] buttons to adjust the temperature set point.

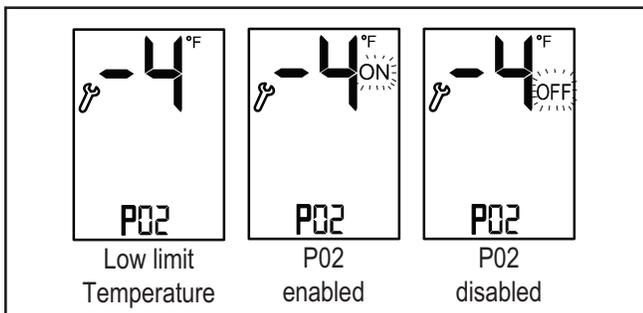
Range: 19...45°F / -7...+7°C

As long as the ambient temperature is lower than the temperature set point P01, the controller will turn ON upon receiving a positive snow signal from the snow detector.



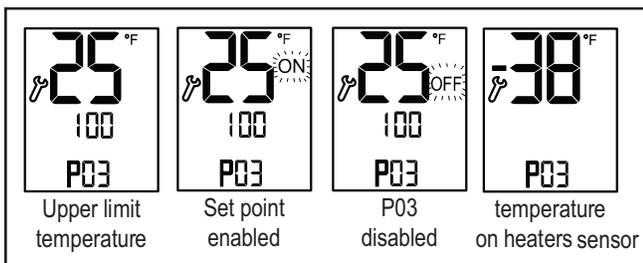
P02 - Lower limit temperature for heating

1. Press the [SELECT] and [+] buttons simultaneously.
2. "P02" and the low limit temperature will appear on display.
3. When the temperature on the temperature sensor drops below the low temperature limit, the heating system will stop.
4. Use the [+] and [-] buttons to adjust the temperature set point.
Range: -4...+23°F / -20...-5°C Default: -4°F / -20°C
5. Press the [SELECT] and [+] buttons simultaneously again.
6. The word "ON" or "OFF" will appear on display.
7. Use the [+] and [-] buttons enable (ON) or disable (OFF) the P02 parameter.
If disabled, the heating system will operate without low temperature limitations.



P03 - Upper limit temperature for heating

1. Press the [SELECT] and [+] buttons simultaneously.
2. "P03" and the slab upper limit temperature will appear on display.
3. Use the [+] and [-] buttons to adjust the upper limit temperature.
Range: +41...+125°F / +5...+52°C Default: 125°F / +52°C
*For numbers above 100, "100" will appear on display.
4. Press the [SELECT] and [+] buttons simultaneously again.
5. The word "ON" or "OFF" will appear on display.
6. Use the [+] and [-] buttons enable (ON) or disable (OFF) the P03 parameter.
7. If disabled, the heaters will work regardless of the upper limit.
8. Press the [SELECT] and [+] buttons simultaneously again.
9. The display will show the temperature on the upper limit sensor.

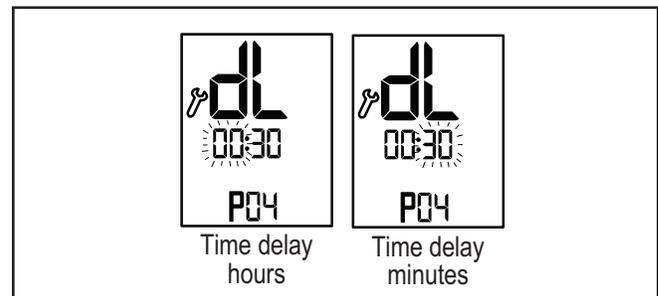


P04 -Time delay before stopping the heater

1. Press the [SELECT] and [+] buttons simultaneously.
2. "P04", "dL" and the time delay before stopping the heater (Hold ON) will appear on display. The hours will blink.
3. Use the [+] and [-] buttons to adjust the hours of the time delay.
Range: 00...99 hours Default: 00 hours
4. Press the [SELECT] and [+] buttons simultaneously again. The minutes will blink.
5. Use the [+] and [-] buttons to adjust the minutes of the time delay.
Range: 00...59 minutes Default: 30 minutes

Note 1. The time delay countdown will start when the snow detection signal from snow sensor will switch from positive to negative.

Note 2. The staggering sequence will continue during the time delay period.

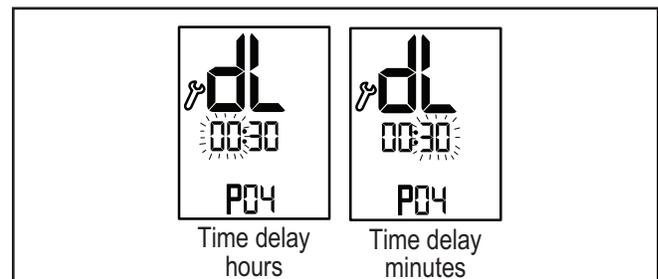


P04 -Time delay before stopping the heater

1. Press the [SELECT] and [+] buttons simultaneously.
2. "P04", "dL" and the time delay before stopping the heater (Hold ON) will appear on display. The hours will blink.
3. Use the [+] and [-] buttons to adjust the hours of the time delay.
Range: 00...99 hours Default: 00 hours
4. Press the [SELECT] and [+] buttons simultaneously again. The minutes will blink.
5. Use the [+] and [-] buttons to adjust the minutes of the time delay.
Range: 00...59 minutes Default: 30 minutes

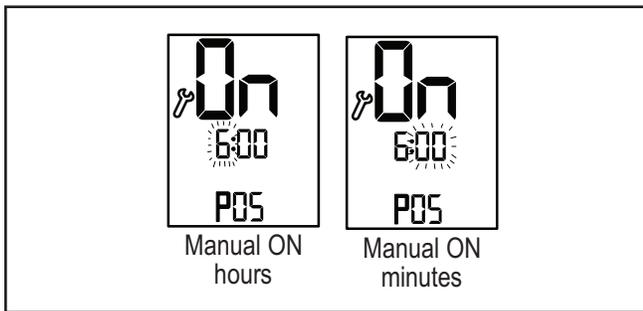
Note 1. The time delay countdown will start when the snow detection signal from snow sensor will switch from positive to negative.

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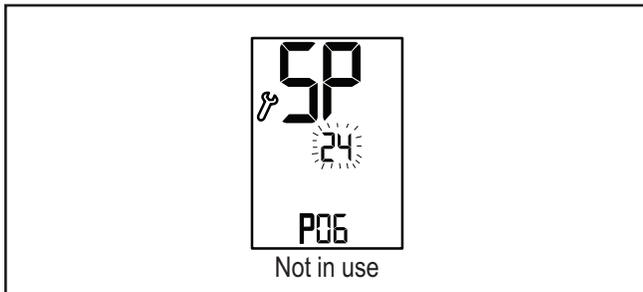
P05 - Manual mode ON time

1. Press the [SELECT] and [+] buttons simultaneously.
2. "P05", "On" and the "Manual ON" mode time period will appear on display. The hours will blink.
3. The delay time parameter defines a time frame in which the heater remains ON after receiving an "Manual ON" command.
4. Use the [+] and [-] buttons to adjust the hours of the working time.
Range: 00...99 hours Default: 6 hours
5. Press the [SELECT] and [+] buttons simultaneously again. The minutes will blink.
6. Use the [+] and [-] buttons to adjust the minutes of the working time.
Range: 00...59 minutes Default: 00 minutes



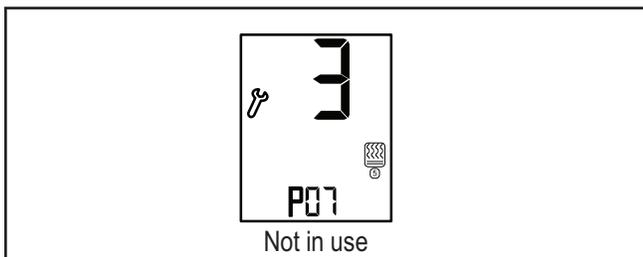
P06 – Not in use

1. Press the [SELECT] and [+] buttons simultaneously.
2. P06" and the letters "SP" will appear on display. Do not change the default value "24"



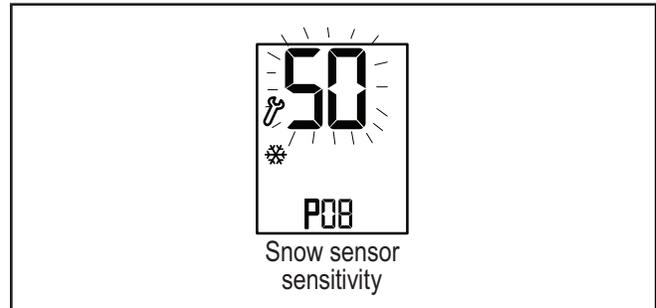
P07 – Not in use

1. Press the [SELECT] and [+] buttons simultaneously.
2. "P07" and the figure "3" will appear on display.
3. Do not change the default value "3".



P08 - Snow sensor sensitivity

1. Press the [SELECT] and [+] buttons simultaneously.
2. "P08" and the snow sensor sensitivity value will appear on display.
3. Use the [+] and [-] buttons to adjust the sensitivity.
Range: 20...80 % (20% - Less sensitive, 80% - more sensitive), Default: 50%

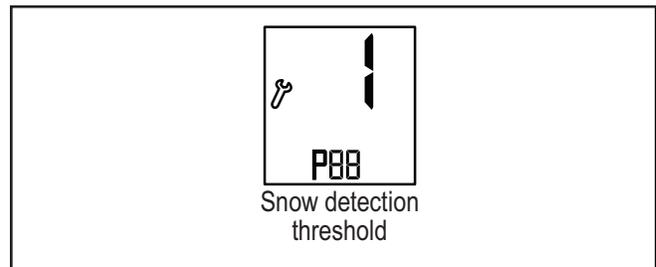


P88 - Snow detection threshold

1. Press the [SELECT] and [+] buttons simultaneously.
2. "P88" and the snow sensor threshold will appear on display.
3. Use the [+] and [-] buttons to adjust the threshold.
Range: 00...60 minutes Default: 5 minutes

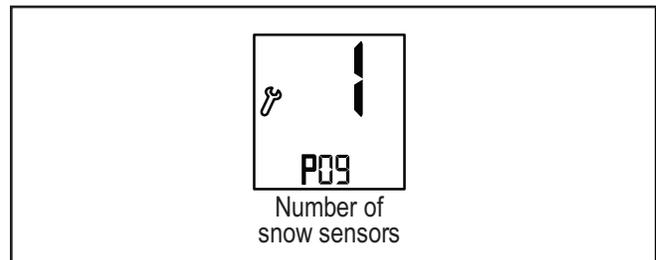
If the threshold is not reached, the logic of turning the heater either ON or OFF will not be affected by snow detection.

During countdown to threshold time, the snow flake icon will flash.



P09 – Number of snow sensors connected

1. Press the [SELECT] and [+] buttons simultaneously.
2. "P09" and the number "1" will appear on display.
3. Do not change the default value "1".



P10 - Test conditions mode / Technician commissioning mode

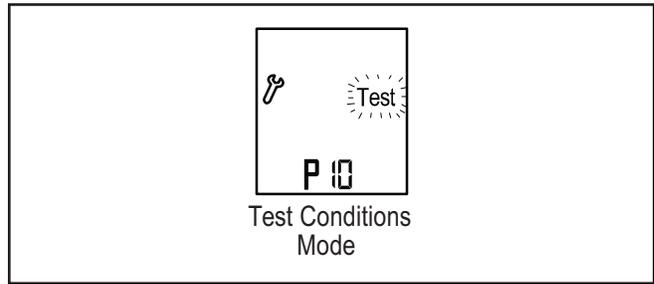
Turn ON test conditions to check the functionality of the system regardless of sensors parameters (i.e. during the summer).

In test conditions, the Ambient temperature is always -5°C/23°F.

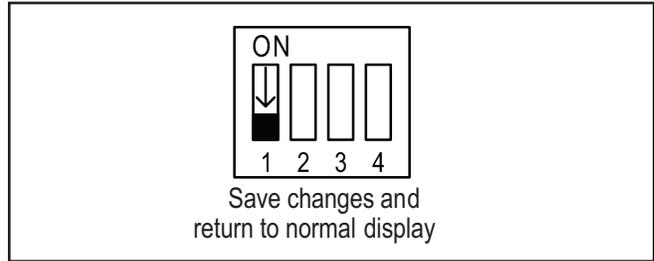
Note: In order to trigger the system and activate the heater, use some water to wet the circuit on top of the snow sensor.

1. Press the [SELECT] and [+] buttons simultaneously.
2. "P10" will appear on display. The hours will blink.
3. Use the [+] button to enter test/commissioning mode – "Test" will appear on display.
4. Use the [+] button to manually exit test/commissioning mode – "Test" will disappear from display.

Note: If the technician did not manually exit test/commissioning mode, the unit will automatically return to normal mode after 5 hours.



In order to save changes and return to normal display, move DIP switch S1 back to OFF position.



Restore Default Values

IMPORTANT: Make sure the unit is turned OFF (the word "OFF" should appear on display).

1. Move DIP switch S1 to ON position.
2. Press and hold the [ON] button for 10 seconds. The thermostat will beep.
3. Move DIP switch S1 back to OFF position.

DIP Switch Settings

DIP switch S2 - Short measuring times (test only)

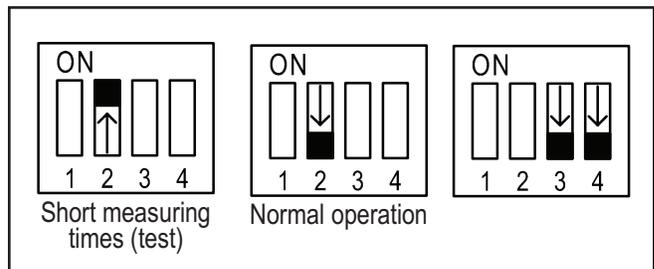
Use DIP switch S2 to short the measuring times as follows:

- "ON" - Short measuring times – for test/commissioning only (measuring times will be divided to 60).
- "OFF" - Normal operation.

Short measuring times:

A real 1 hour will take 1 minute and a real 1 minute will take 1 second.

DIP switches S3 and S4 – Not in use – must remain OFF

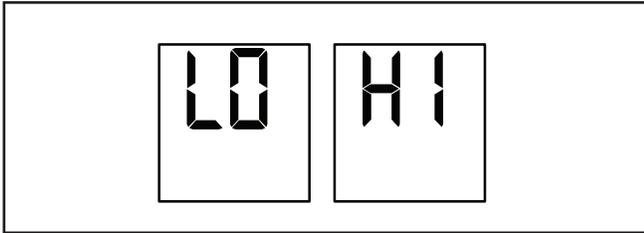


Temperature Reading Errors

Ambient temperature sensor readings (on snow sensor) are out of reliable measuring range

Ambient temperature < -9°F/-23°C

Ambient temperature > 54°F/12°C

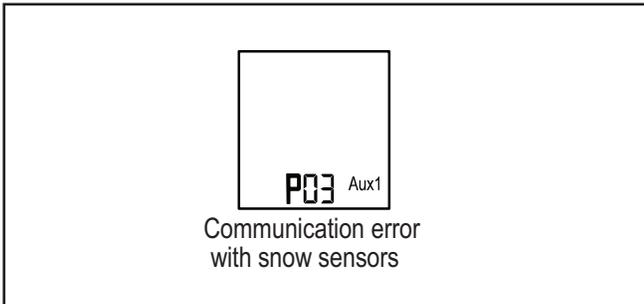


The system will continue to operate using constant predefined values. In addition, the display will alternate between “LO” and -11°F/-24°C for low temperature readings, and between “HI” and 55°F/13°C for high temperature readings.

Error 1 – Communication error with one (or more) snow sensors

“SensErr 1” Will appear on display.

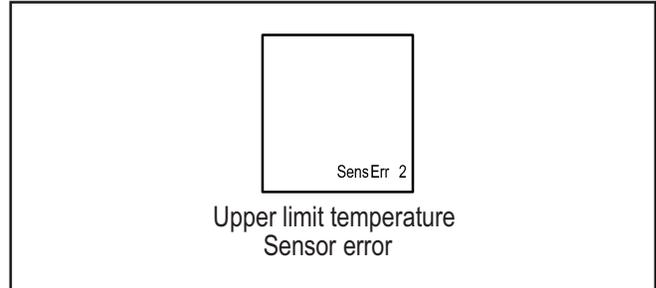
If the system is configured to work with more than 1 snow sensor, the faulty snow sensor number will appear on display: P01, P02, P03 or P04.



The system will use readings from snow sensor 1 instead of the missing readings from the faulty snow sensor.

Error 2 – Upper limit temperature sensor is not connected or short circuit

“SensErr 2” Will appear on display.



The system will continue to operate regardless of the upper limit temperature.

Required actions:

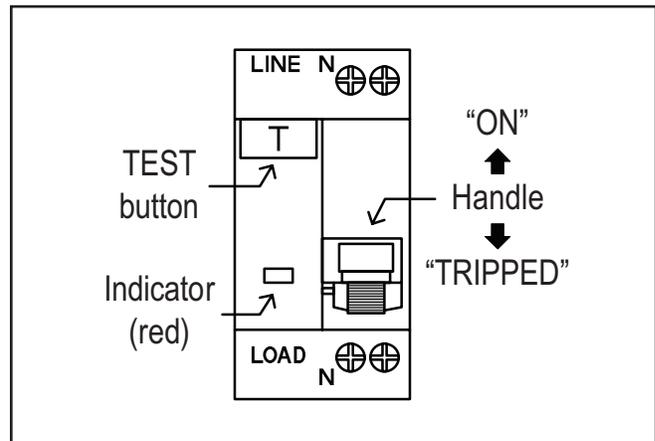
1. Refer to P03 section of the technician settings.
2. Check the temperature value and disable the sensor if needed.
3. Replace the sensor.

Testing the Internal GFEP Circuit Breaker

The GFEP is designed to protect circuits by sensing when a ground fault or earth leakage is greater than 30mA and automatically open the circuit.

The GFEP should be tested regularly, at least once per month.

1. Press TEST button "T", GFEP should open automatically and the red indicator should act.
2. Move the handle back to "ON" position to return to normal operation and reestablish power and protection.
3. Test button should be pressed 3 times and the GFEP should work normally.
4. If GFEP can't work normally, it must be replaced.



Limited Warranty:

Please refer to the Chromalox limited warranty applicable to this product at <http://www.chromalox.com/customer-service/policies/termsofsale.aspx>.

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