



PYROCON12

Controller and User Interface panel

Owner's manual & Technician Settings



Smart Heating Solutions

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Rev.5.2.5

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Introduction

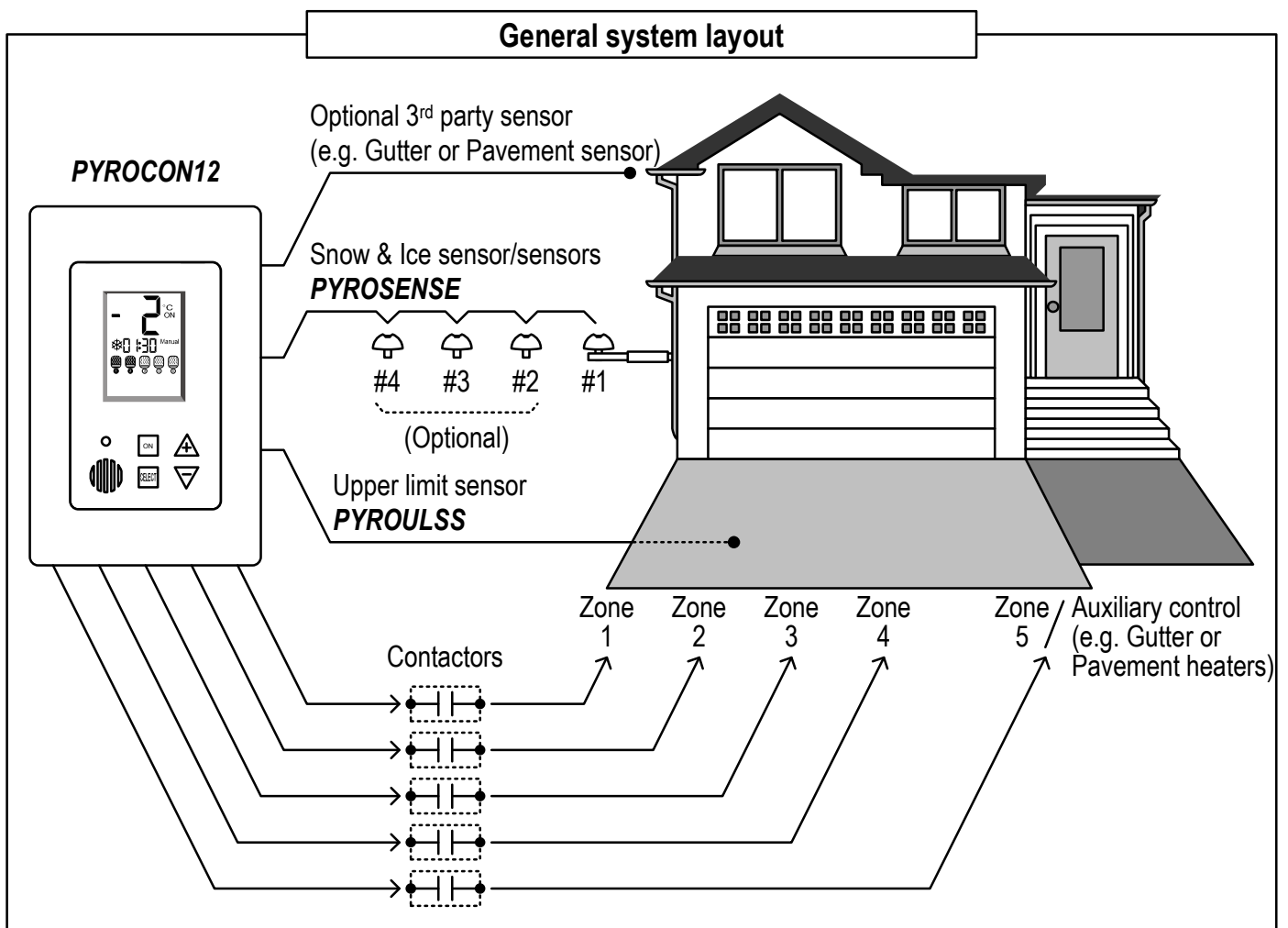
The PYROCON12 offers smart and easy control over the PYRO Snow & Ice Melting system. It can operate up to 4 snow melting zones and one auxiliary zone, with selectable sequencing method. Typical applications include driveways, sidewalks, loading docks, stairs, pavements and gutters.

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

The Use of several zones staggering allow covering larger area for snow melting with less available electrical power.

The PYROCON12 offers various operating and programming options such as:

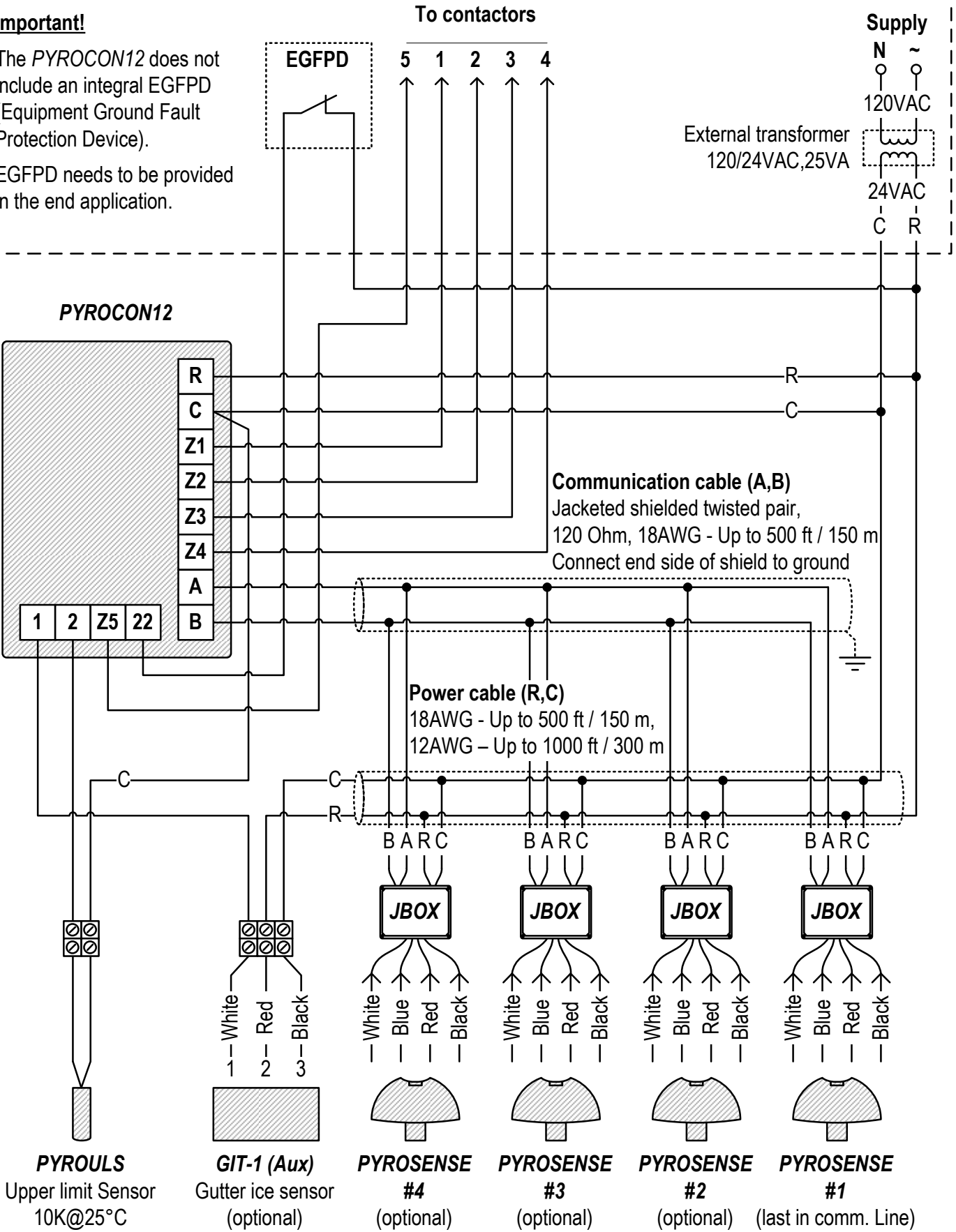
- Switchable temperature scales (°F or °C)
- Both Automatic and Manual modes
- Adjustable heaters cycle and splitting times
- Adjustable heaters hold on off delay
- Optional auxiliary control based 3rd party snow sensor (e.g. Gutter sensor)
- Adjustable Lower ambient temperature limit to stop heaters (lockout)
- Energy saving temperature limit
- Adjustable snow sensor sensitivity
- Commissioning/Test environment



Wiring diagram for stand alone configuration

Important!

The PYROCON12 does not include an integral EGFPD (Equipment Ground Fault Protection Device). EGFPD needs to be provided in the end application.



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

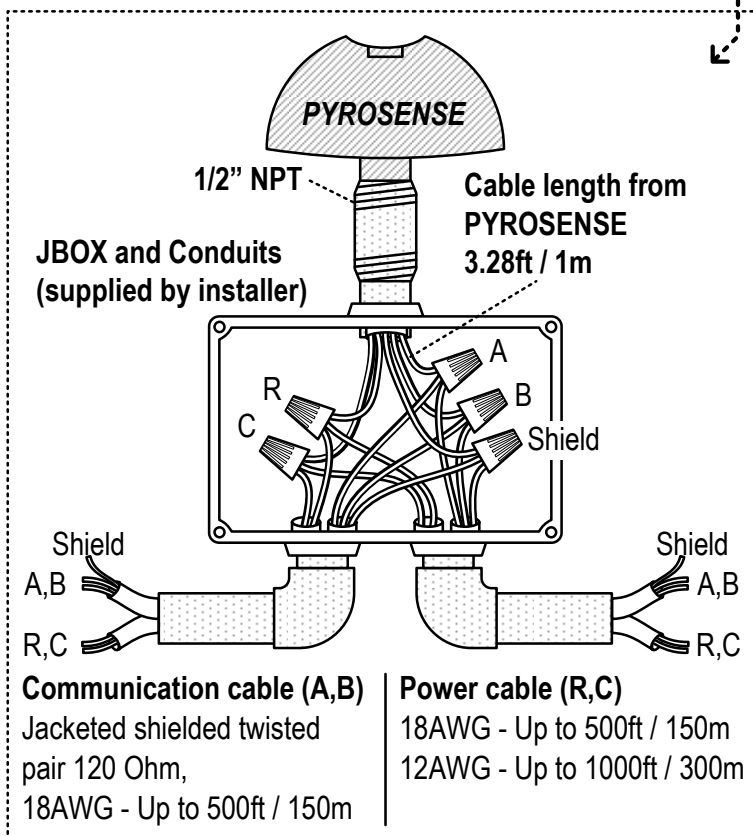
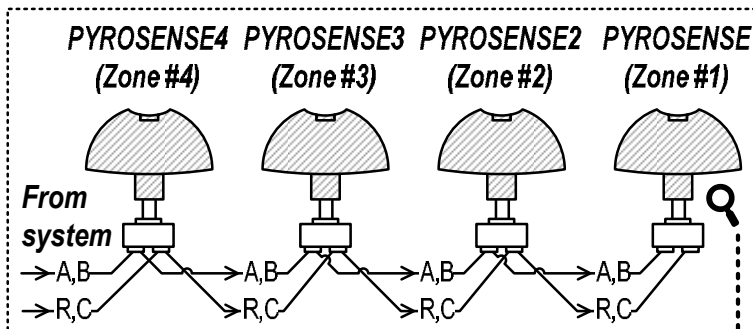
PYROSENSE	MAC Address 1
PYROSENSE2	MAC Address 2
PYROSENSE3	MAC Address 3
PYROSENSE4	MAC Address 4

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

The snow sensors will control zones upon the following logic:

Number of sensors connected	Sensor #	Zones controlled by the sensor
1	1	1,2,3,4,5*
2	1	1,2
	2	3,4,5*
3	1	1
	2	2
	3	3,4,5*
4	1	1
	2	2
	3	3
	4	4,5*

*Zone 5 - optional



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.

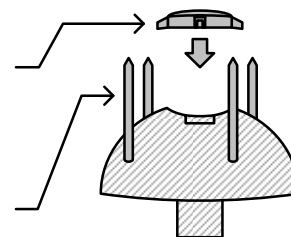
The PYROSENSE is supplied with:

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.



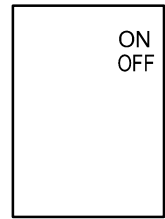
PYROCON12

Owner's manual & Technician Settings

Operating instructions

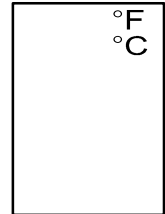
Turning the system ON and OFF

- Press and hold the [ON] button for 0.5 seconds to turn the system ON or OFF.
- The words “ON” or “OFF” will appear on display.



Selecting temperature scale

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

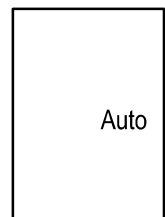


Selecting Automatic or Manual mode

- Press the [SELECT] button to switch between modes:

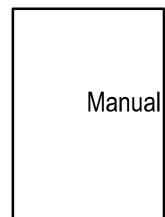
“Automatic”

Heating will start and stop automatically depending on snow detection by the snow sensor/sensors.



“Manual ON”

Heating will start regardless of snow sensor measurements and will stop after a preset time (pls. refer to the “Manual ON” section in the technician settings P05).



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

Heaters indication

The number beneath the heater icon indicates the heater stage (1 to 5).

Black icon – Heater ON

White icon – Heater OFF



Stg. 1 Stg. 2 Stg. 3 Stg. 4 Stg. 5



Heater ON



Heater OFF

Snow flake icon and digital time indication

A solid snow flake icon will appear on display while sensing snow and during normal heaters operation.



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

The snow flake icon will disappear from display as long as the heaters are turned off.

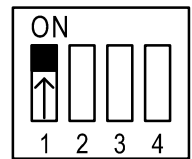
Technician settings

Use the technician settings mode to view and adjust the following parameters:

P01	Temperature set point	P06	Heaters cycle time / Splitting time
P02	Lower ambient temperature limit to stop heaters	P07	Sensors and heaters control logic
P03	Energy saving, upper slab temperature limit to stop heaters	P08	Snow sensor sensitivity
P04	Time delay before stopping the heaters	P88	Snow detection threshold
P05	ON time for manual mode	P09	Number of snow sensors connected
		P10	Commissioning / Test mode
			Restore defaults

Enter technician settings mode

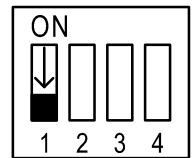
- Move DIP switch S1 located on the side of thermostat to ON position.
- Press the [SELECT] and [+] buttons simultaneously to move forward to the next technician parameter.
- Press the [SELECT] and [-] buttons simultaneously to return to the previous technician parameter.



Enter technician settings mode

Save changes and exit technician settings mode

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



Save changes and exit technician settings mode

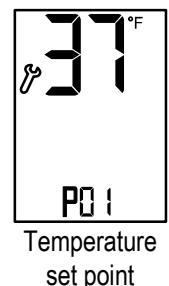
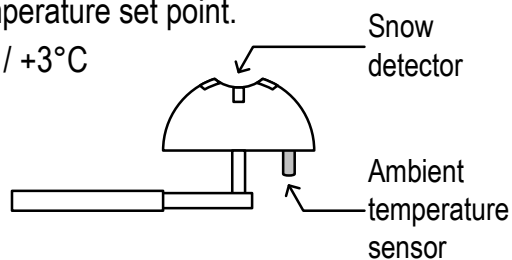
Important: Changes made to technician parameters will not take effect as long as DIP switch S1 is in ON position.

Parameters:

P01 - Temperature set point

- Move DIP switch S1 located on the side of thermostat to ON position to enter technician settings mode.
- "P01" and the temperature set point will appear on display.
- Use the [+] and [-] buttons to adjust the temperature set point.
Range: 19...45°F / -7...+7°C, default 37°F / +3°C

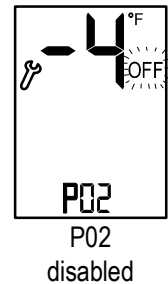
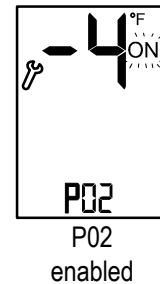
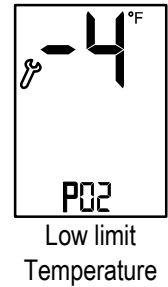
As long as the ambient temperature is lower than the temperature set point P01, the PYROCON will turn ON upon receiving a positive snow signal from the snow detector.



Technician settings (Cont')

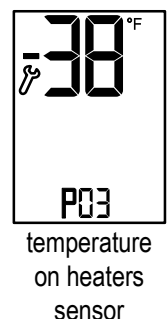
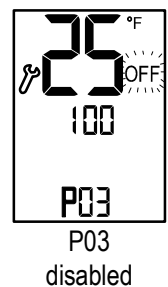
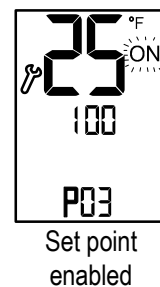
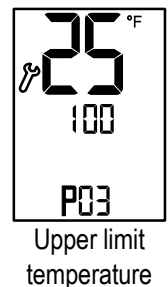
P02 - Lower limit temperature for heating

- Press the [SELECT] and [+] buttons simultaneously.
- "P02" and the low limit temperature will appear on display.
When the temperature on the temperature sensor drops below the low temperature limit, the heating system will stop.
- Use the [+] and [-] buttons to adjust the temperature set point.
Range: -4...+23°F / -20...-5°C Default: -4°F / -20°C
- Press the [SELECT] and [+] buttons simultaneously again.
- The word "ON" or "OFF" will appear on display.
- 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

- Press the [SELECT] and [+] buttons simultaneously.
- "P03" and the slab upper limit temperature will appear on display.
- 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.
- Press the [SELECT] and [+] buttons simultaneously again.
- The word "ON" or "OFF" will appear on display.
- Use the [+] and [-] buttons enable (ON) or disable (OFF) the P03 parameter.
If disabled, the heaters will work regardless of the upper limit.
- Press the [SELECT] and [+] buttons simultaneously again.
- The display will show the temperature on the upper limit sensor.



↳ Cont'

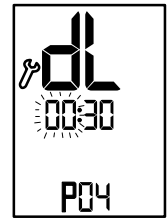
Technician settings (Cont')

P04 - Time delay before stopping the heaters

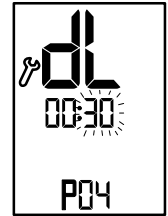
- Press the [SELECT] and [+] buttons simultaneously.
- "P04", "dL" and the time delay before stopping the heaters (Hold ON) will appear on display. The hours will blink.
- Use the [+] and [-] buttons to adjust the hours of the time delay.
Range: 00...99 hours Default: 00 hours
- Press the [SELECT] and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



Time delay
hours



Time delay
minutes

P05 - Manual mode ON time

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



Manual ON
hours



Manual ON
minutes

P06 – Heaters cycle and splitting time

- Press the [SELECT] and [+] buttons simultaneously.
- "P06", "SP" and the splitting time will appear on display. The minutes will blink.
The heaters cycle / splitting time parameter defines the working time of the heaters when working in sequence.
Example: the splitting time is set to 10 minutes and 4 heaters work in sequence, each heater will be ON for 2.5 minutes ($10/4=2.5$).
- Use the [+] and [-] buttons to adjust the splitting time.
Range: 10...1999 minutes Default: 24 minutes.



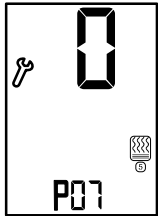
Splitting time

↳ Cont'

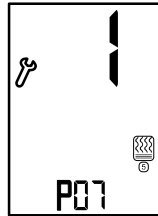
Technician settings (Cont')

P07 - Heaters outputs logic controlled by PYROSENSE snow melt sensor or by 3rd party sensor

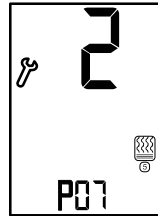
- Press the [SELECT] and [+] buttons simultaneously.
- "P07" and the figures "0", "1", "2" or "3" will appear on display.
- Use the [+] and [-] buttons to define the heaters logic (model dependent) as follows:



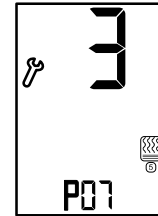
1-5 by PYROSENSE
4 & 5 Together



1-4 by PYROSENSE
5 by 3rd party sensor



1-5 by 3rd party sensor



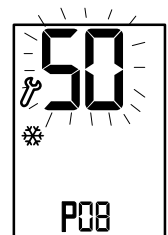
snow on any of the sensors
will trigger all zones

Value	Outputs controlled by PYROSENSE	Outputs controlled by 3 rd party sensor	Comments
0	All outputs	-	Outputs 4 and 5 will turn ON or OFF together. Default.
1	1,2,3,4	5	
2	-	All outputs	The display will not show the ambient temperature and will remain blank.
3	1,2,3,4,5		Snow on any of the sensors will trigger all zones

Note: 3rd party sensors - i.e. gutter or pavement sensors – CIT, GIT, SIT by eti.

P08 - Snow sensor sensitivity

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



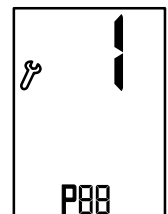
Snow sensor
sensitivity

P88 - Snow detection threshold

- Press the [SELECT] and [+] buttons simultaneously.
- "P88" and the snow sensor threshold will appear on display.
- Use the [+] and [-] buttons to adjust the threshold.
Range: 0...60 minutes Default: 1 minute

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

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



Snow detection
threshold

↳ Cont'

PYROCON12

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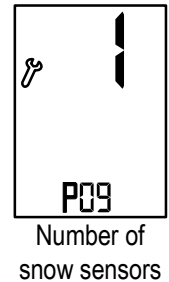


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Technician settings (Cont')

P09 – Number of snow sensors connected

- Press the [SELECT] and [+] buttons simultaneously.
- “P09” and the number of snow sensors connected will appear on display.
- Use the [+] and [-] buttons to select 1, 2, 3 or 4 snow sensors.



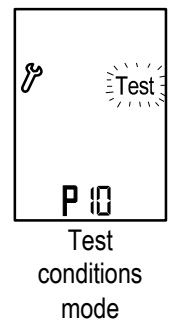
P10 - Test conditions mode / Technician commissioning mode

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 $-5^{\circ}\text{C}/23^{\circ}\text{F}$.

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

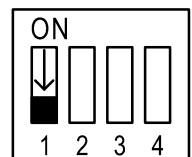
- Press the [SELECT] and [+] buttons simultaneously.
- “P10” will appear on display. The hours will blink.
- Use the [+] button to enter test/commissioning mode – the word “Test” will appear on display.
- Use the [-] button to manually exit test/commissioning mode – the word “Test” will disappear from display.



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

Save changes and return to normal display

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



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

Restore default values

Important: Make sure the unit is turned OFF (the word “OFF” should appear on display).

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

Technician settings (Cont')

DIP switch S2 - Short measuring times (test only)

- Use DIP switch S2 to short the
 - “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.

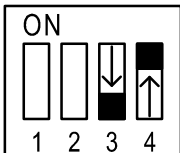
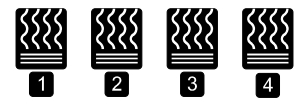
DIP switches S3 and S4 – heaters sequencing logic

- Use DIP switches S3 and S4 to define the sequencing logic of the heater (zones) as follows:



S3 OFF, S4 OFF

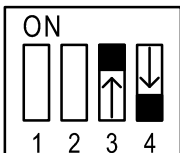
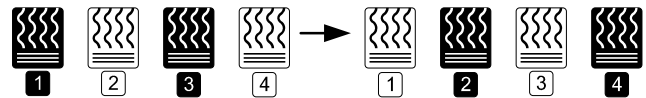
All 4 outputs work per request from the snow sensor(s)



S3 OFF, S4 ON

Outputs 1+3 and outputs 2+4 work together (according to splitting time)

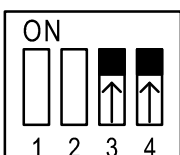
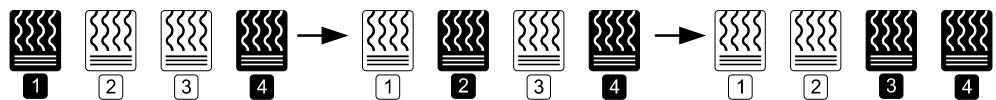
Note: Do not use this configuration with more than two snow sensors connected.



S3 ON, S4 OFF

Outputs 1,2 and 3 work in sequence (according to splitting time) and output 4 works continuously.

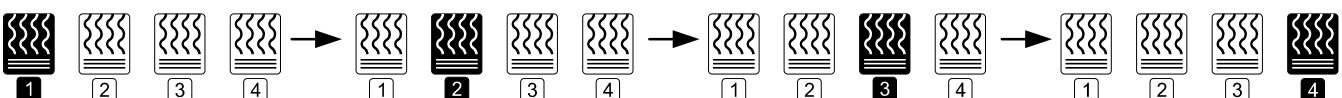
Note: Do not use this configuration with more than two snow sensors connected.



S3 ON, S4 ON

All 4 outputs work in sequence (according to splitting time)

Note: Do not use this configuration with more than two snow sensors connected.



Note: if output 5 is set to work together with outputs 1-4, (see “Heater output no. 5 logic” in the technician settings), it will operate the same as output 4.

Technician settings (Cont')

Enable/Disable zones

Follow the steps below to enable or disable each of the 5 zones.

By default, all zones are enabled.

1. Turn the thermostat OFF.
2. Press and hold both the [+] and the [-] buttons simultaneously for 10 seconds.
3. Choose the required zone using the [Select] button. Selected zone number will appear on display and the heater icon will flash.
4. Use the [+] button to enable the selected zone (black heater icon).
5. Use the [-] button to disable the selected zone (white heater icon).
6. Repeat steps above 3 to 5 for any required zone.
7. Press and hold both the [+] and the [-] buttons simultaneously again for 5 seconds to return to normal display.

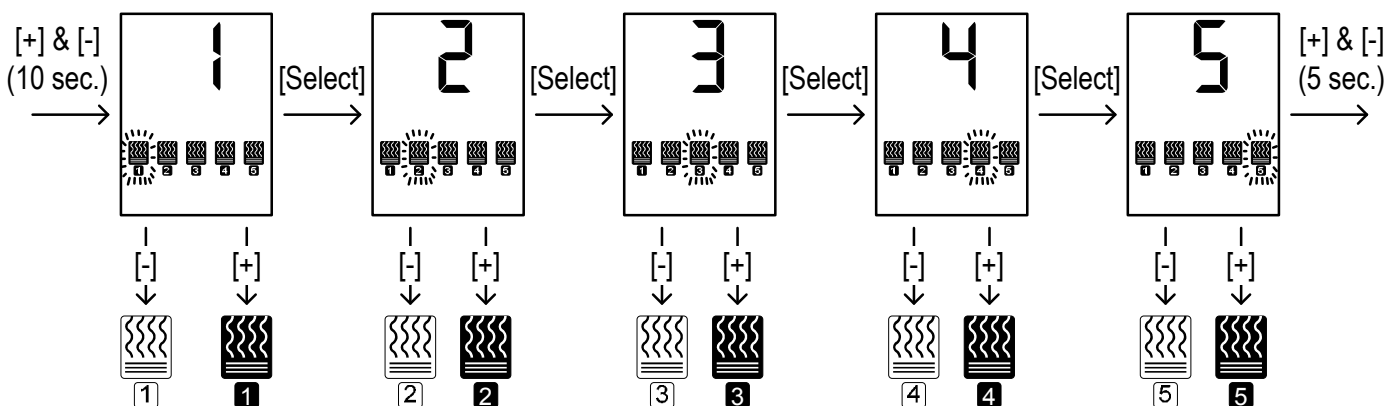
Note: Disabled zones will be ignored in splitting time calculations:


Example: the splitting time is set to 60 minutes and heaters are set work in sequence.


3 Heaters enabled and 1 heater disabled.

With all heaters enabled: Each heater will be ON for 15 minutes ($60/4=15$).

With 3 heaters enabled and 1 heater disabled: Each heater will be ON for 20 minutes ($60/3=20$).



 Black icon – Zone enabled

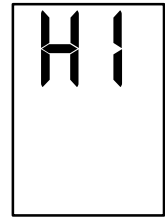
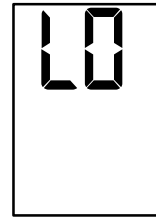
 White icon – Zone disabled

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



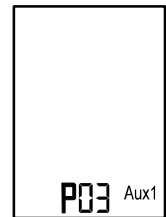
The system will continue to operate using constant predefined values. In addition, the display will alternate between "LO" and -11°F/-24°C for low temperature readings, and between "HI" and 55°F/13°C for high temperature readings.

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.



Communication error with snow sensors

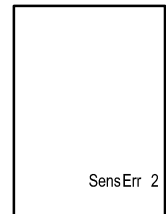
Error 2 – Upper limit temperature sensor is not connected or short circuit

"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.



Upper limit temperature Sensor error



Smart Heating Solutions

<p>Enter technician settings</p>		<p>Move DIP switch S1 located on the side of thermostat to ON position.</p>
<p>P01 Temperature set point</p>		<p>Adjust the temperature set point. Above this temperature the outputs to the heaters will not be activated.</p>
<p>P02 Low limit temperature</p>		<p>Adjust and enable/disable the low limit temperature. When temperature on snow sensor drops below the low temperature limit, the heating system will stop.</p>
<p>P03 Upper limit temperature</p>		<p>Adjust and enable/disable the upper limit temperature, and display temperature on heaters sensor. Note: If the upper limit control is disabled, the heaters will work regardless of the upper limit.</p>
<p>P04 Time delay</p>		<p>Adjust the time delay before stopping the heaters. 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.</p>
<p>P05 Manual ON</p>		<p>Adjust the "Manual ON" mode time period. The delay time parameter defines a time frame in which the heaters remain ON after receiving a "Manual ON" command.</p>
<p>P06 Splitting time</p>		<p>Adjust the splitting time. The heaters cycle / splitting time parameter defines the full cycle working time of all the heaters when working in sequence.</p>
<p>P07 Logic of sensors And outputs</p>		<p>Define heaters control by "0" - 1-5 by PYROSENSE. 4 & 5 operate together. PYROSENSE sensor "2" - 1-5 by 3rd party. Temperature display blank. or by 3rd party sensor. "3" - snow on any of the sensors will trigger all zones.</p>
<p>P08 Snow sensor sensitivity</p>		<p>Adjust the snow sensor sensitivity value (20% - Less sensitive, 80% - more sensitive)</p>
<p>P88 Snow sensor threshold</p>		<p>Adjust the threshold. If the threshold is not reached, the logic of turning the heaters either ON or OFF will not be affected by snow detection. During countdown to threshold time, the snow flake icon will flash.</p>
<p>P09 Number of snow sensors</p>		<p>Select the number of PYROSENSE snow sensors connected.</p>
<p>P10 Test mode (commissioning)</p>		<p>Turn ON test conditions to check the functionality of the system regardless of sensors parameters. Use some water to wet the circuit on top of the snow sensor. Note: If the technician did not manually exit test/commissioning mode, the unit will automatically return to normal mode after 5 hours.</p>
<p>Save changes and Exit technician settings</p>		<p>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.</p>

<p>Restore default values</p>	<p>Important: Make sure the unit is turned OFF (the word "OFF" should appear on display). Move DIP switch S1 to ON position. Press and hold the [ON] button for 10 seconds. Move DIP switch S1 back to OFF position.</p>
<p>DIP switch S2 - Short measuring times (test only)</p>	<p>- "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.</p>
<p>DIP switches S3 and S4 - heaters sequencing logic</p>	<p>Use DIP switches S3 and S4 to define the sequencing logic of the heater (zones) as follows: All 4 outputs work per request from the snow sensor(s)</p>
	<p>Outputs 1+3 and outputs 2+4 work together (by splitting time) Note: Do not use this configuration with more than two snow sensors connected.</p>
	<p>Outputs 1, 2 and 3 work in sequence (by splitting time) and output 4 works continuously. Note: Do not use this configuration with more than two snow sensors connected.</p>
	<p>All 4 outputs work in sequence (by splitting time) Note: Do not use this configuration with more than two snow sensors connected.</p>
	<p>Note: If output 5 is set to work together with outputs 1-4, (see "Heater output no. 5 logic" in the technician settings), it will operate the same as output 4.</p>
<p>Enable/Disable zones</p>	<p>Turn Unit OFF. While OFF, press both the [+] and [-] buttons for 10 sec. Press the [Select] button to select zone. Press the [+] and [-] buttons enable/disable the selected zone. Black - Enabled zone. White - Disable zone. Press both the [+] and [-] buttons for 5 seconds to exit.</p>



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