SUPPLEMENTAL INSTRUCTIONS

PID Tuning Guide

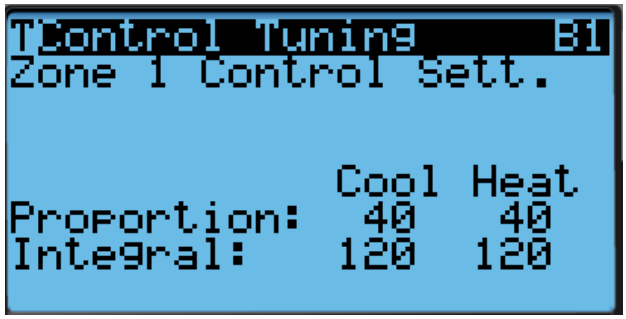
The LC6000 utilizes a PID loop to determine heating and cooling demand. Each zone has its own cooling and heating tuning parameters. Because each zone has its own tuning parameters, each zone can be customized to react better to the profile of the load and size of the area being conditioned. A typical PID loop utilizes three elements: proportion, integral and derivative. For simplicity, the LC6000 only utilizes the proportion and integral elements.

It is important to note that the proportion and integral elements work together to provide the demand value. When making changes to the control settings, it is recommended that only one setting be changed at a time to help identify how much of an impact the change has and which element is driving the demand more.

To navigate to the PID menu:

1. Press MENU key to go to the Main Menu screen.
2. Press UP or DOWN keys and ENTER key to enter TECHNICIAN password 1313.
3. Press UP or DOWN keys to scroll to **Adv System Config**; press ENTER key.
4. Press UP or DOWN keys to scroll to **Control Tuning B1** (Zone 1), **Control Tuning B** (Zone 2) or **Control Tuning B3** (Zone 3).
5. Press ENTER key to scroll to desired setting (see FIgure 1).
6. Press UP or DOWN keys to change the value.
7. Press ENTER key to save.

FIGURE 1



Proportion

The proportion element determines how much output is required based on how far away the space temperature is compared to the setpoint. A higher proportional value set in the controller will generate more demand per 1 degree away from setpoint. A lower proportional value set in the controller will generate less demand per 1 degree away from setpoint.

A value of 360 applied to the proportional setting will result in 100% demand output when the space temperature is 1 degree away from setpoint. A value of 36 applied to the proportional setting will result in 100% demand output when the space temperature is 10 degrees away from setpoint.

Factory default is 40 for proportional gain.

A calculation can be used to determine the band the proportion will operate in.

200/(Desired Temperature Band in °C) = Proportional Setting

EXAMPLE:

1. Desired band – 10°F
2. Convert to Delta degrees Celsius – 10/1.8 = 5.5°C

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NOTE: *Conversion should not include the 32° offset between Celsius and Fahrenheit*

3. Use Proportional Setting Formula – 200/5.5°C = 36

The information found in Table 1 was created to provide a quick reference to the desired temperature band and the proportional setting.

TABLE 1

Proportional Setting	Band °F	Band °C
360	1	0.6
180	2	1.1
120	3	1.7
90	4	2.2
72	5	2.8
60	6	3.3
51	7	3.9
45	8	4.4
40	9	5.0
36	10	5.6

Integral

The integral element determines how much output is generated based on how far and how long the space temperature has been above or below the setpoint. A higher integral setting will require the space temperature to be further away from the setpoint for a longer duration before the integral part of the calculation starts to drive the demand up. A lower integral setting will require the space temperature to be further away from the setpoint for a shorter duration before the integral part of the calculation starts to drive the demand up.

- A low integral setting will be more reactive.

CAUTION: *Too low of an integral setting can cause the PID loop to react too much and cause the loop to lose control.*

- A high integral setting will cause the control to be less reactive.

CAUTION: *Too high of an integral value will cause the loop to become so slow that the loop will not react until the integral term has expired and will often overreact at this point.*

Factory default is 120 for integral time band.