JouleTemp – PID Operation

JouleTemp offers PID (Pulsed) output via the control relay output (C1/C2 output)

PID stands for proportional, integral, derivative and is usually used to pulse valves or Solid state relays with a variable duty cycle from 0% (ie C1/C2 stays open) through say 50% (C1/C2 closed half the time) to 100% (C1/C2 stays closed).

PID operation is turned OFF in the JouleTemp by default. To activate you MUST use a computer interface and call Phasefale for an activation code. The activation code is generated by Phasefale from the JouleTemp module serial number which can be found top left on the Maintenance page of the web interface. Once activated the PID parameters CAN be adjusted via the keyboard interface.

JouleTemp Maintenance Page – PID setup

The PID output will pulse to drive a cooling output by default (eg refrigeration solenoid valve) or if the control is set to heating a heater relay.

PID Parameters Described – Advanced Page

** Ptn should be seconds

JouleTemp Advanced Page – PID parameters

Setpoint (SP) [from the programming page] this is the target temperature the controlled space
Differential (dl) [from the programming page] setting has NO EFFECT on the PID operation

PID Control (Pid) The P setting is a multiplier used to scale how much effect the proportional error temperature has on the PID output. The proportional error temperature is calculated as (Setpoint) - (Temperature Reading) = (Error Temperature). Setting P higher will increase the proportional effect on the PID output. Setting P lower will reduce the proportional effect on the PID output. The setting is symmetrical around setpoint and will have an equal but opposite effect for positive and negative error temperatures.

Integral (Pig) The I setting works as per P but on the integral of the error temperature.

Derivative (Pdg) The D setting works as per P but on the derivative of the error temperature.

Min Switching Time (Ptn) sets the minimum switching cycle time in seconds (note there is a typo on the screen in minutes). Therefore can be used to ensure a minimum ON time of the output. Ptn=5 sec. Duty Cycle output is 25%. Therefore on time will be 5 seconds, off time will be 15 seconds. Can also be set to 0 for fastest operation.

Overall Response: The P, I and D values are all calculated and scaled as above and then summed to generate the actual PID output, so each parameter effects the overall response.

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