

Tuning a PID Loop

Mechanical Engineering

The closed-loop Ziegler-Nichols method, and the checks around it.

A starting point, not a finished tune. Always detune afterwards.

1

Turn I and D off

Proportional only, with the loop in automatic and stable.

2

Raise gain to steady cycling

That gain is the ultimate gain; the cycle time is the period.

3

Apply the PID rule

Gain 0.6 of ultimate, integral half the period, derivative an eighth.

4

Detune for the overshoot

Ziegler-Nichols aims at quarter decay, which most plants find lively.

5

Test a disturbance too

Setpoint tracking and disturbance rejection are not the same test.

**Never drive a real plant into sustained oscillation without a safety case.
Educational reference only.**