

Frequency response analysis and optimum tuning for temperature control system

ABSTRACT

The paper presents frequency response analysis of temperature control system through Bode Diagram. From the open loop manual test, First Order Plus Dead Time model reflects open loop process behavior. SISOTOOL function in Matlab is utilized for designing the Proportional and Integral Controller. Besides, this paper proposes Routh-Hurwitz stability criterion to calculate stability margin and Compensator Ratio for obtaining optimized controller settings and the analysis were justified through Process Control Simulator, SE-201. It was found that Compensator ratio of 0.095 is the optimized tuning, which gives proportional gain of 16.2% and time constant is 65s for both servo and regulatory control.