

Unistat® 910w

Periodic and Aperiodic on a Radleys 10-litre glass reactor

Requirement

Every Unistat can be set to ramp “Fast with small overshoot” or “No overshoot”. This case study looks at the response of a Unistat 910w working with a Radleys 10-litre reactor under different “control dynamics”.

Method

The Unistat and reactor are connected using two 1.5-metre insulated metal hoses. The reactor is filled with 7.5 litre of “M90.055.03”, a Huber supplied silicon based HTF.

Results

The first and second curves (20 °C to 60 °C and back to 20 °C) show the function of “Periodic – fast, small overshoot” control dynamic. The first curve illustrates a heating from 20 °C to 60 °C in a time of 26 minutes. It can be clearly seen that the internal temperature heats to 86 °C, thus the process temperature reaches 60 °C very quickly. The Unistat 910w cools the 10-litre reactor back to 20 °C in approximately 17 minutes through a ΔT of 40 K.

The third and fourth curves (20 °C to 60 °C to 20 °C) shows the same temperature profile but with “Aperiodic - no overshoot” control. The Unistat takes slightly longer to heat and cool to avoid any over or undershoot of the set-point.

Setup details

Unistat® 910w & Radleys reactor

- Temperature range: -90...250 °C
- Cooling power: 5.2 kW @ 250...-20 °C
- Heating power: 6.0 kW
- Hoses: 2x1.5 m; M30x1.5 (#6386)
- HTF: DW-Therm (#6479)
- Reactor: 10-litre jacketed glass reactor
- Reactor content: 7.5 litre M90.055.03 (#6259)
- Stirrer speed: 200 rpm
- Control: process

