



Setup details

Unistat® 405w & HWS reactor

- Temperature range: -45...250 °C
- Cooling power: 1.3 kW @ 0 °C
0.7 kW @ -20 °C
- Heating power: 1.5 kW / 3 kW
- Pump speed: 3300 rpm
- Hoses: 2x1 m; M24x1.5 (#9325)
- HTF: DW-Therm (#6479)
- Reactor: 5-litre glass reactor
- Reactor contents: 3.75 litre M90.055.03 (#6259)
- Reactor stirrer speed: 200 rpm
- Control: process



Unistat® 405w

Periodic and Aperiodic difference

Requirement

A standard feature of the "Unistat-Pilot" is to choose "fast, small overshoot" or "without overshoot" when reaching a setpoint. This case study looks at the ability of the Unistat 405w to control the process temperature in a 5-litre HWS un-insulated glass reactor under these two different control dynamics, "Fast-with overshoot" or "No overshoot".

Method

The reactor and Unistat 405w are connected using two 1-metre insulated metal hoses and the reactor is filled with 3.75 litre of "M90.055.03", a silicon based HTF. The Unistat controls the temperature at 20 °C and then a new set-point of 60 °C is entered.

Results

The graphic shows the differences in performance between these settings. In this test the Unistat 405w is programmed to alternate between 20 °C and 60 °C. The first process curve (fast, small overshoot) reaches 60 °C in just 25 minutes with the second process curve (without overshoot) takes 31 minutes to reach the setpoint. It can be seen that the overshoot is very minimal in the "fast, small overshoot" mode.

