Unistat® 510w

Cooling and heating a Chemglass 50-litre jacketed glass reactor between 20 °C and -30 °C

Requirement

This case study demonstrates the speed of response and level of control achievable when a Chemglass 50-litre reactor is connected to a Unistat 510w.

Method

The Unistat and reactor were connected using two 1.5 m insulated metal hoses. The reactor was filled with 37 litre of "M90.055.03", a Huber supplied silicon based HTF.

Results

The process is ramped from 20 °C to -30 °C (50 K) in approximately 70 minutes while heating back to 20 °C takes approximately 25 minutes. In both cases the process reaches and maintains the new set-point with negligible over or under shoot.

Setup details

Unistat® 510w & Chemglass 50-litre reactor

Temperature range:	-50...250 °C
Cooling power:	5.3 kW @ 250…0 °C
	2.8 kW @ -20 °C
	0.9 kW @ -40 °C
Heating power:	6.0 kW
Hoses:	2x1.5 m; M30x1.5 (#6659)
HTF:	DW-Therm (#6479)
Reactor:	50-litre Chemjacketed glass reactor (un-insulated)
Reactor content:	37 litre M90.055.03
Stirrer speed:	80 rpm
Control:	process

Under "Fast – small overshoot" the jacket temperature creates a wider ΔT from the set-point resulting in a faster process temperature ramp rate and a very small overshoot.

Small process temperature overshoot

Legend:
- Jacket temperature
- Process temperature
- Setpoint

Technical details and dimensions are subject to change. No liability is accepted for errors or ommisions.