Unistat® 830

Heating and cooling a HWS 5-litre reactor

Requirement
The graphic shows the heating and cooling performance of a Unistat 830 alternating between temperature set-points of 20 °C and 100 °C.

Method
The Unistat and reactor are connected using two 1.5-metre insulated metal hoses. The reactor is filled with 3.75 litre of "M90.055.03", a Huber supplied silicon based HTF.

Results
For the heating process the internal temperature jumps to approximately 115 °C in 23 minutes. This is heating ramp rate average of 4.13 K/min. to the process. As a result the process temperature reaches 100 °C in 40 minutes.
For the cooling curve, the internal temperature cools to -17 °C in 12 minutes. This represents an average cooling ramp rate of 3.1 K/min. The set-point of 20 °C is reached within 28 minutes.

Setup details
Unistat® 830 & HWS reactor

Temperature range:	-85...200 °C
Cooling power:	3.6 kW @ 0 °C 2.2 kW @ -60 °C 3.6 @ 0 °C 3.5 @ -20...-40 °C 2.2 @ -60 °C 0.7 @ -80 °C
Heating power:	3 kW
Hoses:	2x1.5 m; M30x1.5 (#6386)
HTF:	DW-Therm (#6479)
Reactor:	5-litre jacketed glass reactor
Reactor contents:	3.75 litre M90.055.03 (#6259)
Reactor stirrer speed:	200 rpm
Control:	process