Unistat® 910w

Cooling a Diehm 100-litre jacketed glass reactor to -60°C

Requirement

This case study looks at the time taken for a Unistat 910w to cool the contents of a Diehm 100-litre un-insulated jacketed glass reactor to -60 °C from 20 °C.

Method

The Unistat and reactor are connected using two 1.5-metre insulated metal hoses. The reactor is filled with 75 litre of "M90.055.03", a Huber supplied silicon based HTF.
A VPC-Bypass was installed to prevent a glass reactor breackage due to the pump pressure and reactor design.

Results

It can be seen that though the 100-litre reactor represents a large thermal load to the Unistat 910w (the Unistat 910w is designed for use on reactors to a maximum of 50 litre), the process ramps through 80 K (20 °C to -60 °C) in around 140 minutes demonstrating great efficiencies in thermal transfer.

Setup details
Unistat® 910w & Diehm 100-litre reactor

Temperature range:	-90…250 °C
Cooling power:	5.2 kW from 250 °C to 20 °C 4.7 kW @ -40 °C 3.1 kW @ -60 °C 0.9 kW @ -80 °C
Heating power:	6.0 kW
Hoses:	M38x1.5; 1x 2m #6657; 1x1m # 6655), VPC Bypass installed
HTF:	M90.055.03 (#6259)
Reactor:	100-litre Diehm un-insulated jacketed glass reactor
Reactor content:	75 litre M90.055.03
Stirrer speed:	410 rpm
Control:	process