

Unistat Grande Fleur

Unistat Grande Fleur controls the process temperature in vacuum insulated 5l glass jacketed reactor from Asahi

Requirement

This case study demonstrates the ability of the Unistat Grande Fleur to control the process temperature in vacuum insulated 5l glass jacketed reactor from Asahi.

Method

The Unistat Grande Fleur was connected to a 5l Asahi vacuum insulated glass reactor via 2 x 1.5 m metal insulated tubes. The HTF used was Huber's M40.165/220.10 and the process mass simulated with 3l of Huber's M40.165/220.10 silicon oil.

Under "Process Control" from a Pt100 (Teflon covered) located in the process mass, different set-points were entered and the performance of the Unistat Grande Fleur was recorded using Huber's service software and recorded onto a USB thumb drive inserted in the USB interface on the Pilot ONE controller.

The agitator speed was set to 250 rpm.

Setup details

Temperature range: -40°C...+200°C

Heating power: 1.8 kW

Cooling power: 0.6 kW @ +100°C

0.6 kW @ 0°C

0.35 kW @ -20°C

0.2 kW @ -30°C

Hoses: 2 x M24 x 1.5m Metal Insulated

HTF: M40.165/220.10

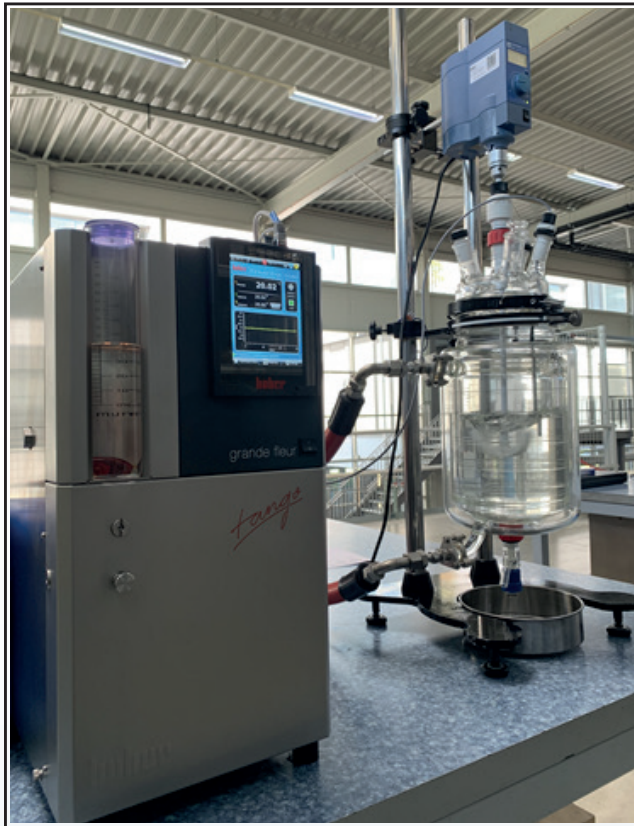
Reactor: Asahi 5l

Reactor content: 3l M40.165/220.10

Control: process

Stirrer speed: 250 rpm

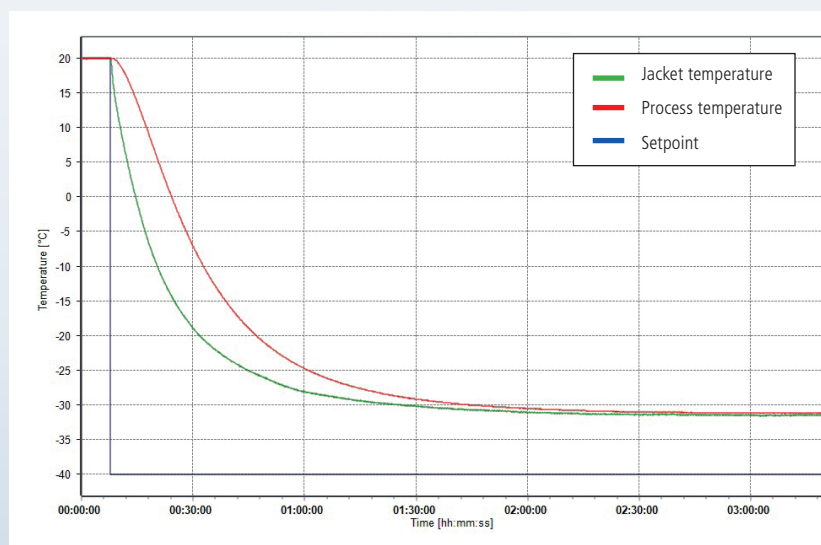
Amb. temperature: +25°C



Results

1. Lowest achievable temperature (Tmin):

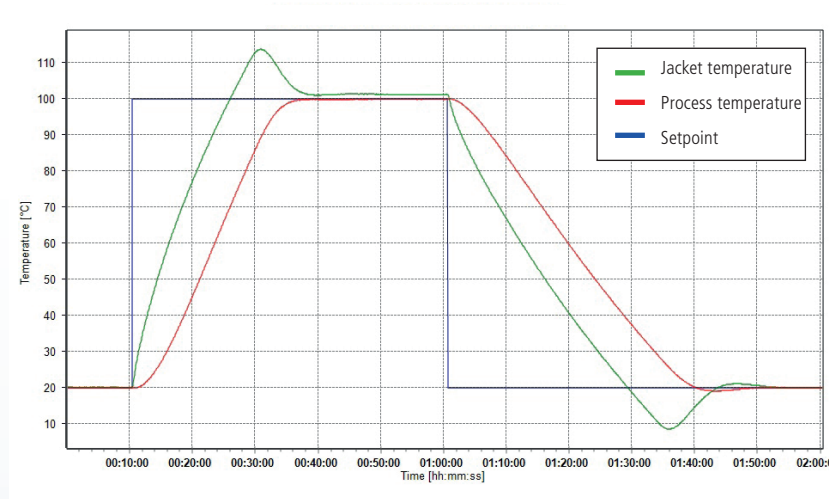
The graphic below demonstrates a minimum achievable process temperature of -31.17°C with a corresponding jacket temperature of -31.43°C.



2. Temperature Control: from +20°C to +100°C and back to +20°C

This test demonstrates the speed and accuracy that the Unistat Grande Fleur control the process temperature from +20°C to +100°C and back to +20°C.

Start (°C)	End (°C)	Approximate time (min)	Average Ramp Rate (K/Min)
+20	+100	27	2.96
+100	+20	49	1.63



3. Temperature Control: from -20°C to +100°C and back to -20°C

This test demonstrates the speed and accuracy that the Unistat Grande Fleur control the process temperature from -20°C to +100°C and cooling down to -20°C.

Start (°C)	End (°C)	Approximate time (min)	Average Ramp Rate (K/Min)
-20	+100	36	3.33
+100	-20	89	1.35

