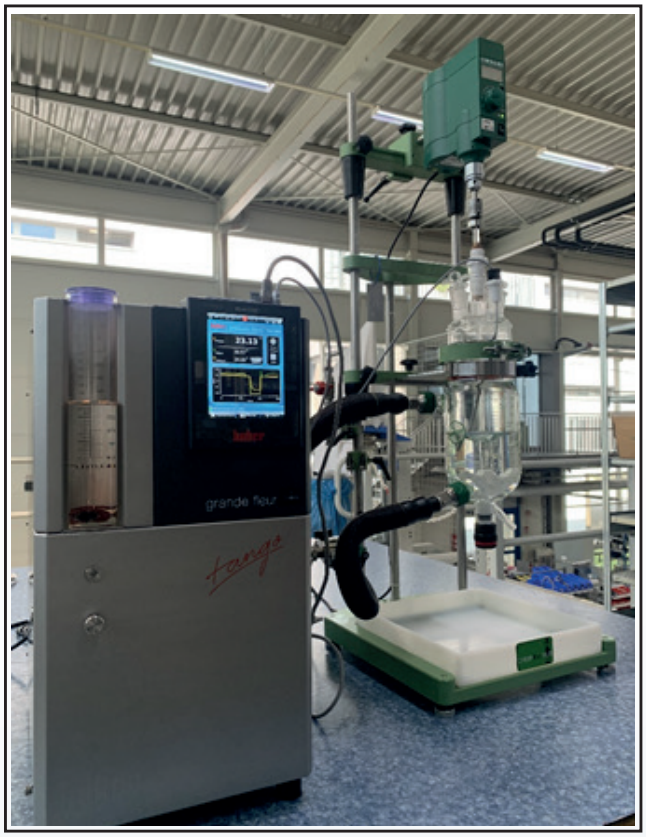
Unistat Grande Fleur



Unistat Grande Fleur controls the process temperature in uninsulated Chemglass 1l glass jacketed reactor

Requirement
This case study demonstrates the ability of the Unistat Grande Fleur to control the process temperature in an un-insulated Chemglass 1l glass jacketed reactor.

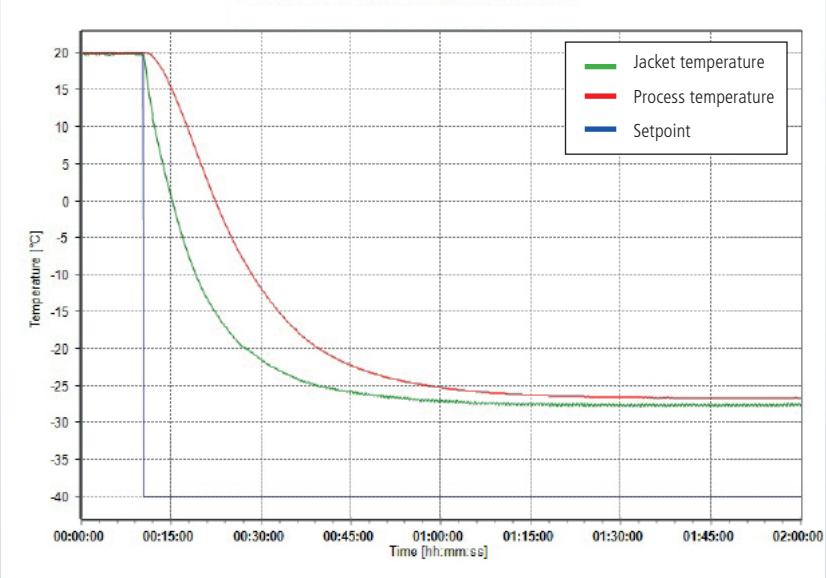
Method
The Unistat Grande Fleur was connected to a 1l Chemglass uninsulated glass jacketed reactor via 2 x 1-meter metal insulated tubes. The HTF used was Huber M40.165/220.10 and the process mass simulated with 0,7l of Huber M40.165/220.10 silicon oil.
Under "Process Control" using a Pt100 (Teflon covered), located in the process mass, different set-points were entered and the performance of the Unistat Grande Fleur was recorded using Huber's software.
The agitator speed was set to 200 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 M16x1m Metal Insulated
HTF:	M40.165/220.10
Reactor:	Chemglass 1l
Reactor content:	0,7l M40.165/220.10
Control:	process
Stirrer speed:	200 rpm
Amb. temperature:	+23°C

Results

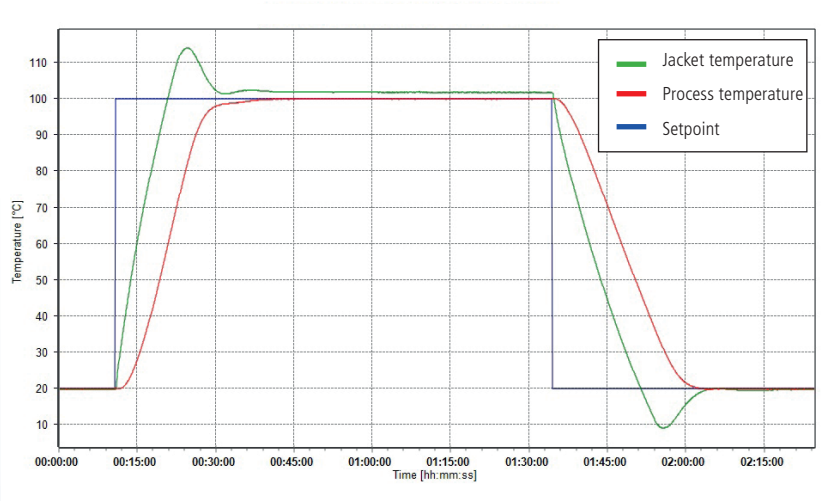
1. Lowest achievable temperature (Tmin):
The graphic below demonstrates a minimum achievable process temperature of -26.7°C with a corresponding jacket temperature of -27.7°C.



Version: 08/2024

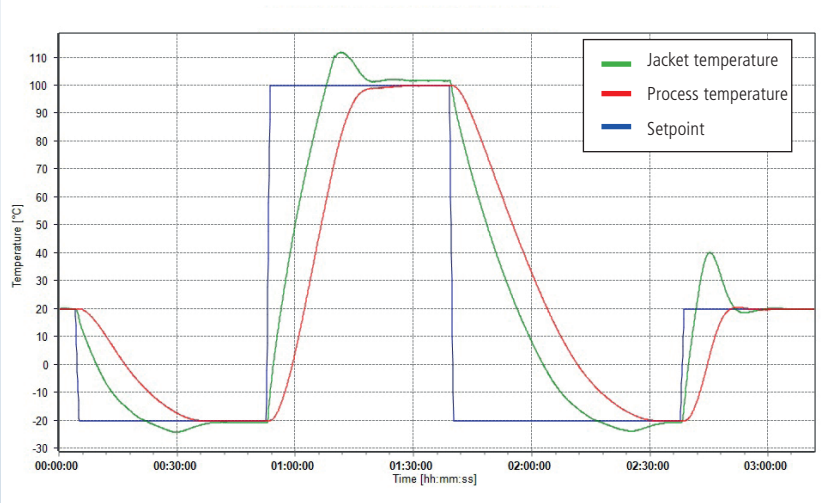
2. Temperature Control: from +20°C to +100°C and back to +20°C
The graphic below shows the speed and accuracy of temperature control as the process is cooled & heated from +20°C to +100°C and back to +20°C.

Start (°C)	End (°C)	Approximate time (min)	Average Ramp Rate (K/Min)
+20	+100	30	2.6
+100	+20	28	2.9



3. Temperature Control: from -20°C to +100°C and back to -20°C
The graphic below shows the speed and accuracy of temperature control as the process is cooled & heated from -20°C to +100°C and back to -20°C.

Start (°C)	End (°C)	Approximate time (min)	Average Ramp Rate (K/Min)
+20	-20	32	1.25
-20	+100	35	3.43
+100	-20	53	2.26
-20	+20	26	1.53



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