

Unistat 620w

Unistat 620w controls an uninsulated Buchi 100l GLSS jacketed reactor

Requirement

This case study demonstrates the ability of the Unistat 620w to control the process temperature in an uninsulated Buchi 100l GLSS jacketed reactor.

The tables and the graphics below show the speed, accuracy and stability as the process temperature is changed to each new set-point.

Method

The Unistat 620w was connected to the 100l uninsulated Buchi Glas Üster reactor with 2 x M30 metal hoses. The process mass was simulated with 80l of Huber's "M40.165/220.10" inside the reactor. Under "Process control" from a Pt100 located inside the process mass, the temperature of the process was cycled through various set-points and the results recorded using Huber's "Spy Service" software via a USB thumb drive inserted in the USB interface on the Pilot ONE controller.

Setup details

Temperature range: -60...+200°C
 Heating power: 12 kW
 Hoses: 2 x M30 Metal Insulated
 HTF: M60.115/200.05
 Reactor: GLSS jacketed reactor 100l
 Reactor content: 80l M40.165/220.10
 Control: process
 Stirrer speed: 250 rpm
 Amb. temperature: +23°C

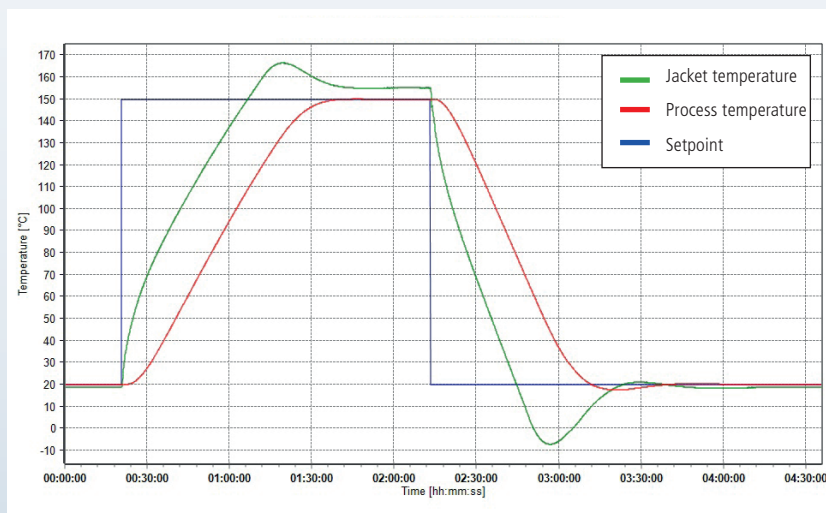


Results

1. Performance. Temperature control from +20°C to +150°C and back to +20°C

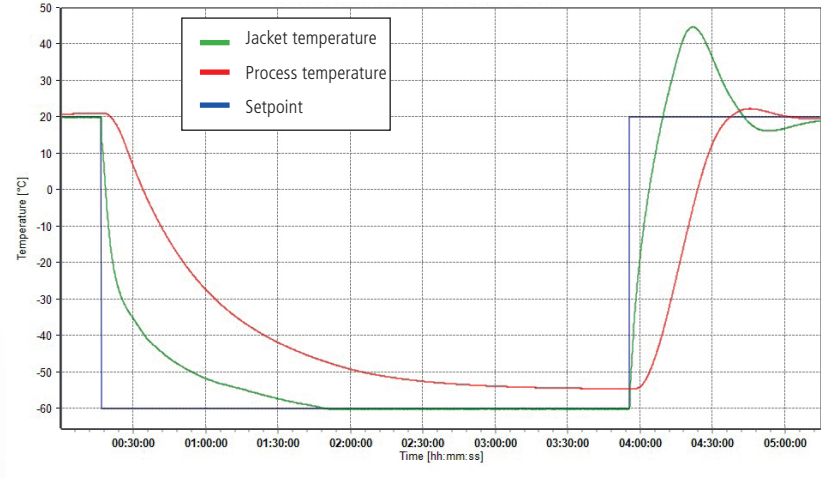
The graphic below shows the speed and accuracy of temperature control as the process is cooled & heated from 20°C to 150°C and back to 20°C.

Start (°C)	End (°C)	Approximate Time	Average Ramp Rate
+20°C	+150°C	81 Minutes	1.6 K/min
+150°C	+20°C	59 Minutes	2.2 K/min



2. Process Temperature: Tmin

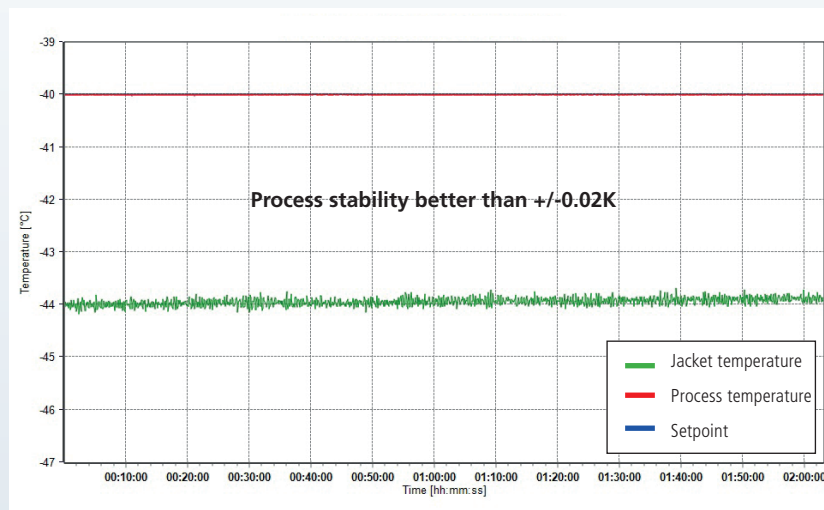
The graphic below demonstrates a minimum achievable process temperature of -54.7°C with a corresponding jacket temperature of -60°C .



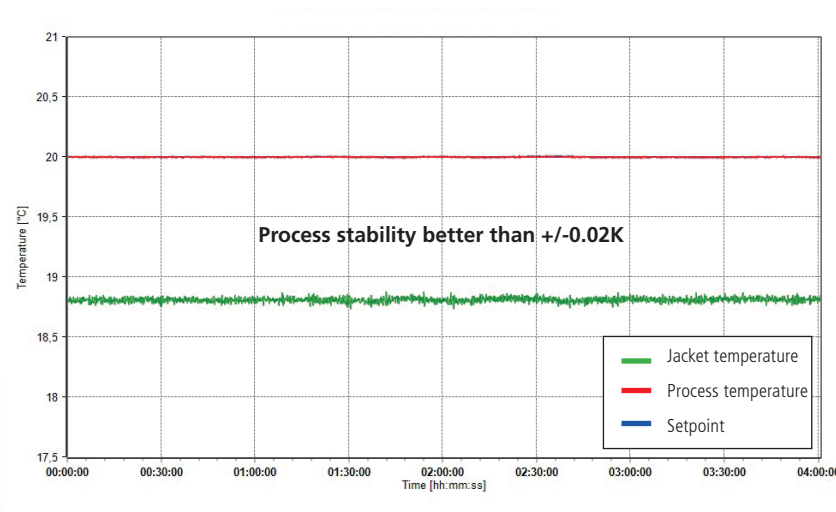
3. Stability

The graphics below demonstrate the stability of process temperature control at -40°C , $+20^{\circ}\text{C}$ and $+150^{\circ}\text{C}$.

Stability at -40°C :



Stability at +20°C:



Stability at +150°C:

