Unistat 530w

This case study demonstrates the ability of the Unistat 530w to control the process temperature in an insulated 100l GLSS reactor from Büchi Glass Uster

Requirement

This case study demonstrates the ability of the Unistat 530w to control the process temperature in an insulated 100l GLSS reactor from Büchi Glass Uster.
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 530w was connected to a 100l Büchi Glass Uster insulated glass lined steel jacketed reactor via 2 x 1.5-meter metal insulated tubes. The HTF used was Huber's M80.100/250.03 and the process mass simulated with Huber's M40.165/220.10 (silicon oil, 80l).
Under "Process Control" from a Pt100 located in the process mass, different set-points were entered and the performance of the Unistat 530w was recorded using Huber's service software and recorded onto a USB thumb drive inserted in the USB interface on the Pilot ONE controller.

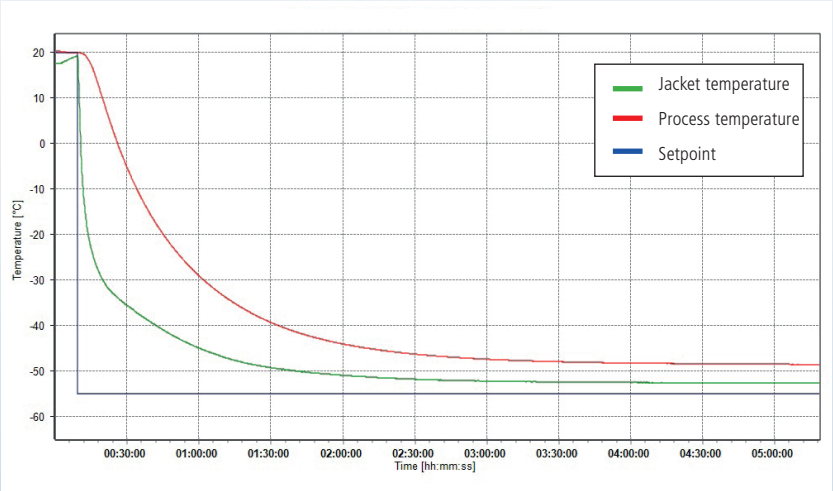
Setup details

Temperature range:	-55...+250°C
Heating power:	12 kW
Hoses:	2 x M30 Metal Insulated
HTF:	M80.100/250.03
Reactor:	Büchi Glass Uster reactor 100l
Reactor content:	80l M40.165/220.10
Control:	process
Stirrer speed:	250 rpm
Amb. temperature:	+23°C

Results

1. Tmin Process Temperature

It can be seen in the graphic below that the minimum achievable process temperature was -48,7°C with a corresponding jacket temperature of -52,8°C.



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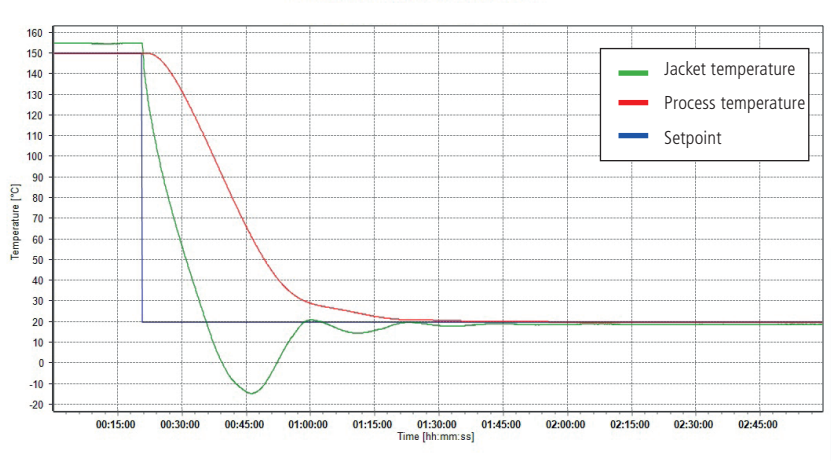
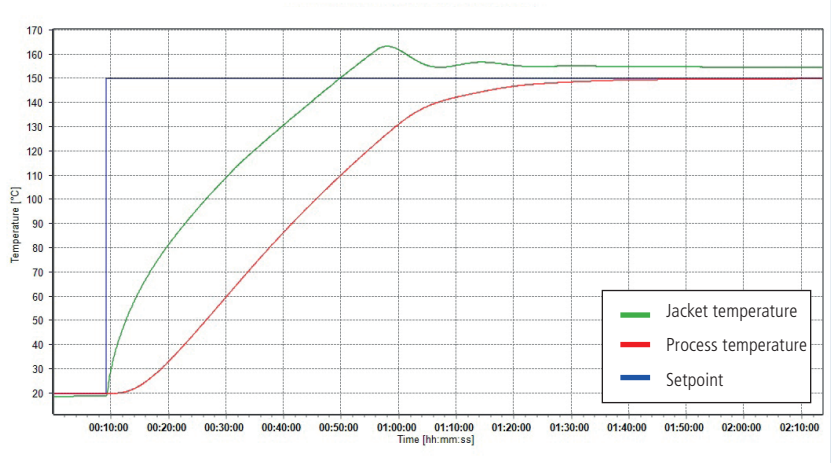
4. Temperature Control: +150°C to +20°C
This test demonstrates the speed and accuracy that the Unistat 530w control the process temperature between +150°C to +20°C.

Start (°C)	End (°C)	Approximate time	Average Ramp Rate
+150°C	+20°C	82 min	1.59 K/min



5. Temperature Control: +20°C to +150°C
This test demonstrates the speed and accuracy that the Unistat 530w control the process temperature between +20°C to +150°C.

Start (°C)	End (°C)	Approximate time	Average Ramp Rate
+20°C	+150°C	93 min	1.4 K/min



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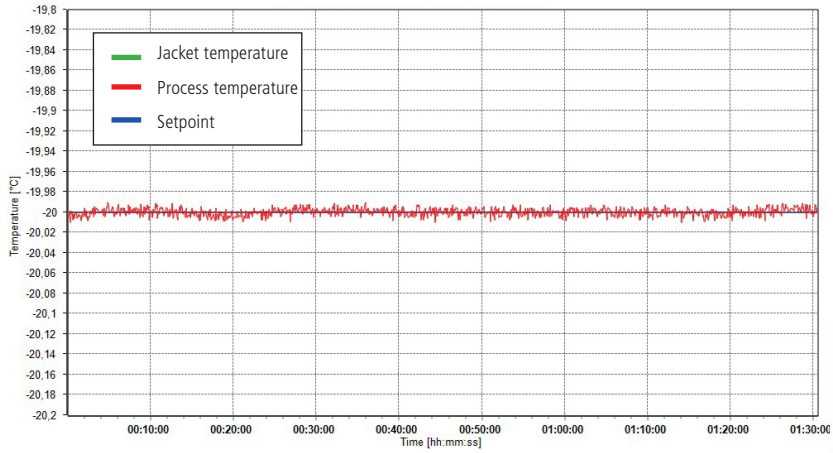
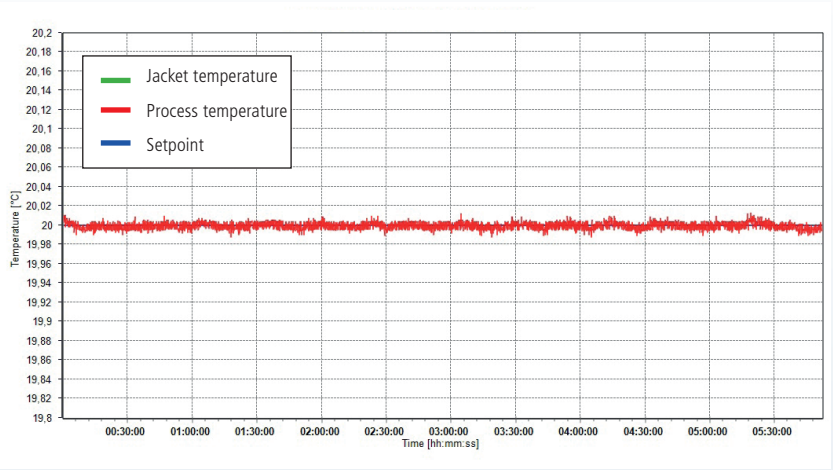
7. Stability

The following graphics demonstrate the stability of temperature control over the process at +150°C, +20°C and -20°C.
It can be seen that the process temperature stability is better than 0.02K at all set-points.

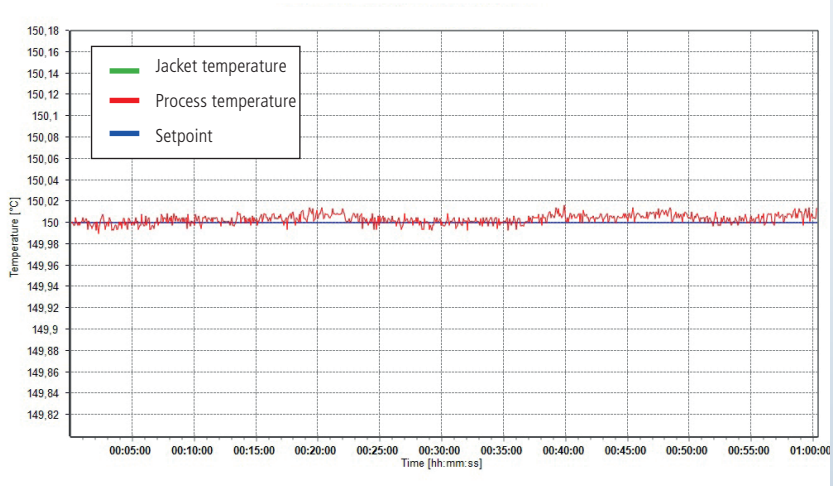
Stability at -20°C



Stability at +20°C



Stability at +150°C



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