Unistat 405w

Unistat 405w controls De Dietrich Process Systems 16l Glass Lined Stainless Steel reactor

Requirement
This case study demonstrates the minimum achievable process temperature, process temperature control and process temperature stability when a Unistat 405w is connected with a De Dietrich Process Systems 16-liter Glass Lined Stainless Steel reactor.

Method
The Unistat 405w was connected to the 16l DDPS QVF GLSS reactor with 1 x 1-meter vacuum insulated hose and 1 x 1.5-meter vacuum insulated hose. The process mass was simulated with 12l of Huber's "DW-Therm" 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.

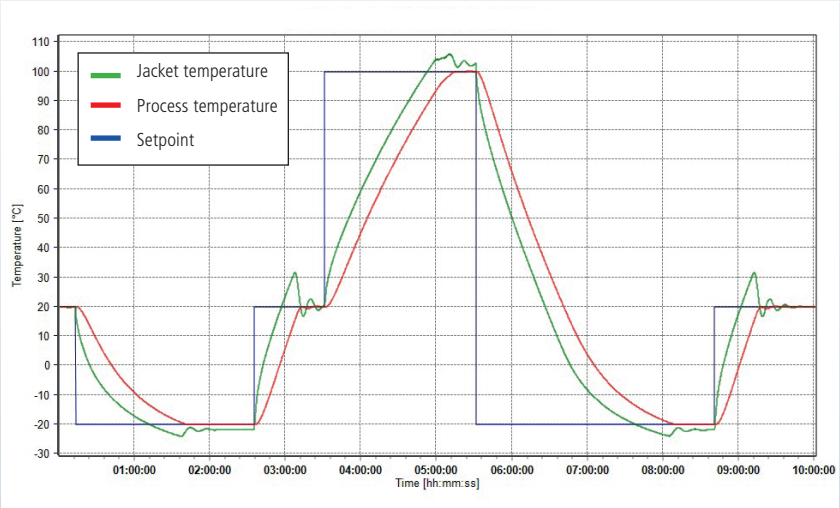
Setup details

Temperature range:	-45°C...+250°C
Heating power:	3.0 kW
Hoses:	2 x M30 Metal Insul.
HTF:	M90.055/170.03
Reactor:	DDPS GLSS 16L50 liter
Reactor content:	12 l DW-Therm
Control:	process
Stirrer speed:	200 rpm
Amb. temperature:	+22°C

Results

1. Performance
The graphic below shows the speed and accuracy as the Unistat 405w cycles the process temperature between -20°C and 100°C.

Start (°C)	End (°C)	Time Taken	Ramp Rate
20°C	-20°C	88 Minutes	0.45 K/Min
100°C	-20°C	160 Minutes	0.75 K/Min
-20°C	20°C	38 Minutes	1 K/Min
20°C	100°C	100 Minutes	0.8 K/Min
100°C	20°C	130 Minutes	0.6 K/Min



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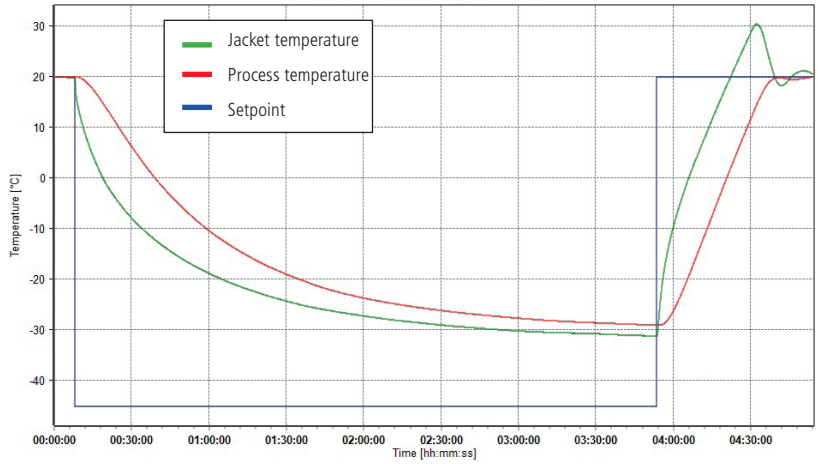
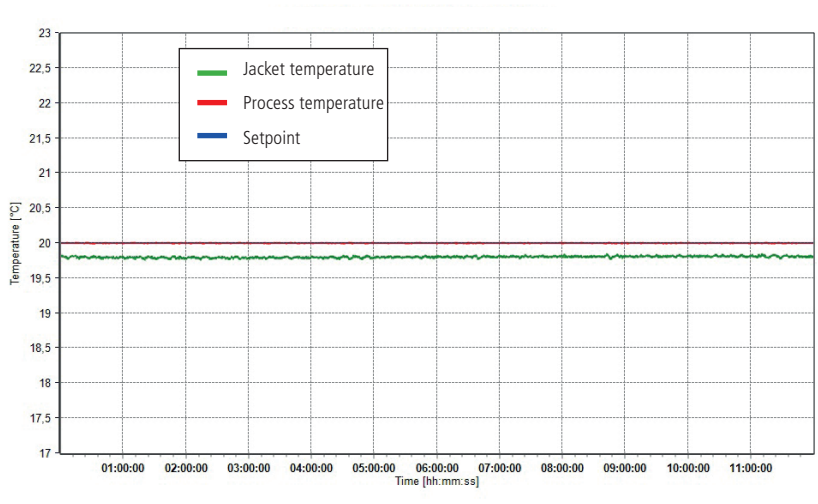
2. Minimum Achievable Process Temperature
The graphic shows that the minimum achievable process temperature was -28.9°C.



3. Stability
The graphic below demonstrates the Unistat 405w's ability to hold the process at 20°C +/- 0.01K over a period of 12-hours.



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