



Unistat 825

Unistat 825 controls the process temperature in a 50l vacuum insulated reactor from Asahi

Requirement

This Case Study demonstrates the control capabilities over the process temperature when a Unistat 825 is connected with an Asahi 50l vacuum insulated reactor.

Method

The Unistat 825 was connected to a 50l Asahi vacuum insulated reactor via 2 x 1,5m metal insulated tubes. The HTF used was Huber's M80.100/250.03 and the process mass simulated with 40l of Huber's DW-Therm.

Setup details

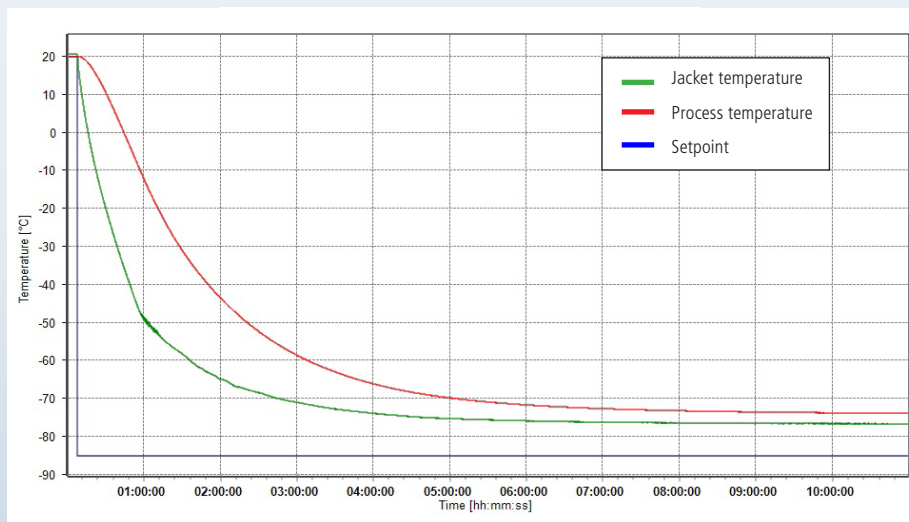
Temperature range:	-85°C...+250°C
Cooling power:	2.3 kW @ +20°C
	2.2 kW @ 0°C
	2.0 kW @ -20°C
Heating power:	3 kW
Hoses:	2 x 1,5m M30 metal Insulated
HTF:	M80.100/250.03
Reactor:	50l Asahi vacuum insulated
Reactor content:	40l DW-Therm
Stirrer speed:	150 rpm
Control:	process
Amb. temperature:	+23°C



Results

1. Lowest achievable temperature (Tmin):

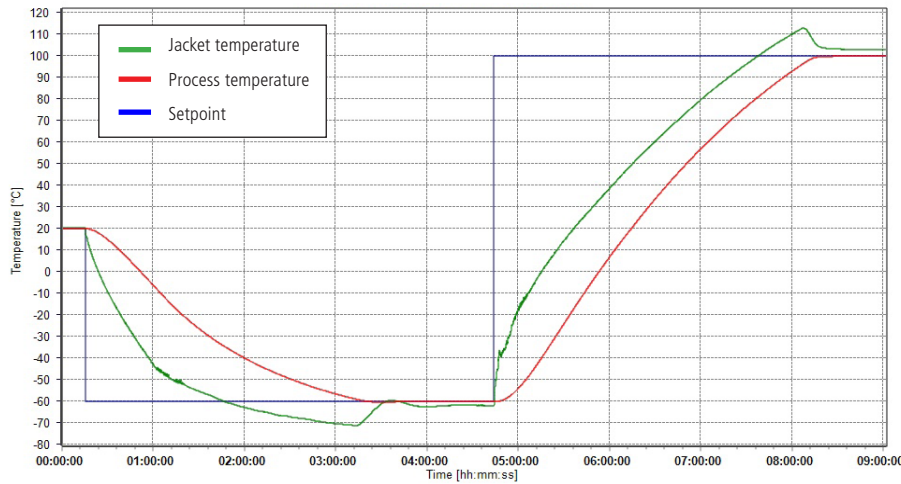
The graphic below shows that the minimum achievable process temperature was -74.4°C with a corresponding jacket temperature of -76.8°C.



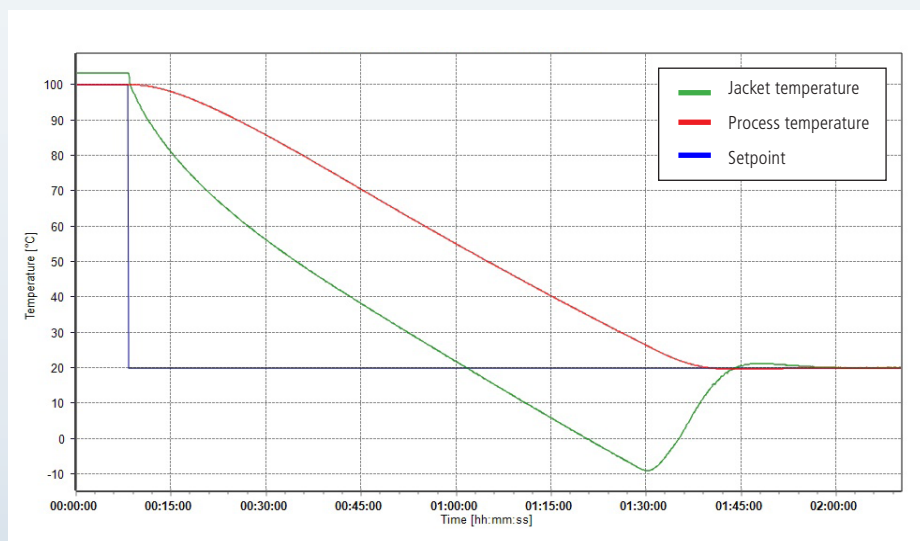
2. Performance: Temperature Control

The graphic shows the speed, accuracy and stability as the Unistat 825 as it reaches and maintains each new set-point.

Start T	End T	Approximate time	Av. Ramp Rate
+20°C	-60°C	186 minutes	0.4 K/min
-60°C	+100°C	214 minutes	0.75 K/min



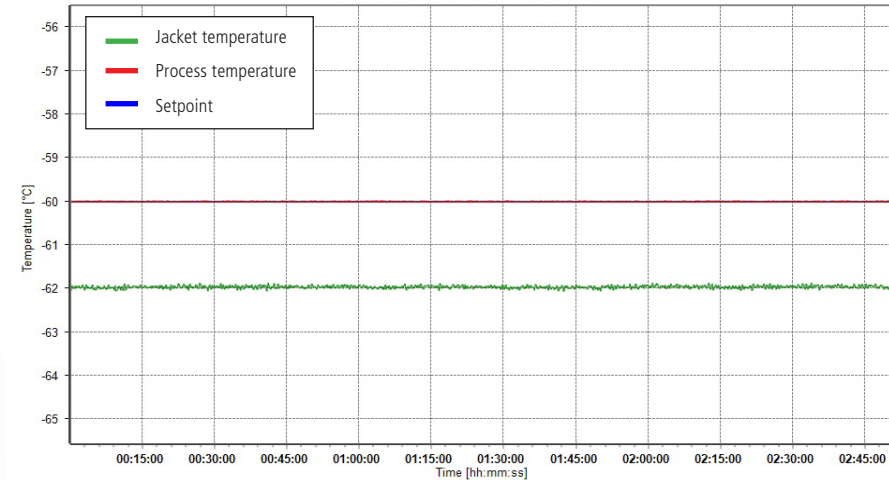
Start T	End T	Approximate time	Av. Ramp Rate
+100°C	+20°C	93 minutes	0.7 K/min



3. Performance: Stability at -60°C and at +100°C

The graphics below demonstrate a temperature stability in the process mass of $\pm 0.01\text{K}$ at set-points of -60°C and 100°C.

Stability at -60°C



Stability at +100°C

