



Unistat P815w

Unistat P815w controls a 5 liter Asahi reactor

Requirement

This Case Study demonstrates the control capabilities over the process temperature when a Unistat 815w is connected with an Asahi 5 liter vacuum insulated reactor over the temperature range of +20°C to -75°C to +140°C and back to +20°C.

Method

The 5 liter Asahi reactor was connected to Unistat P815w using 1,5 meter metal insulated hoses M30. The thermofluid used in the system was DW-Therm. Process control was carried out. Stirrer speed was set to 150 rpm.

Setup details

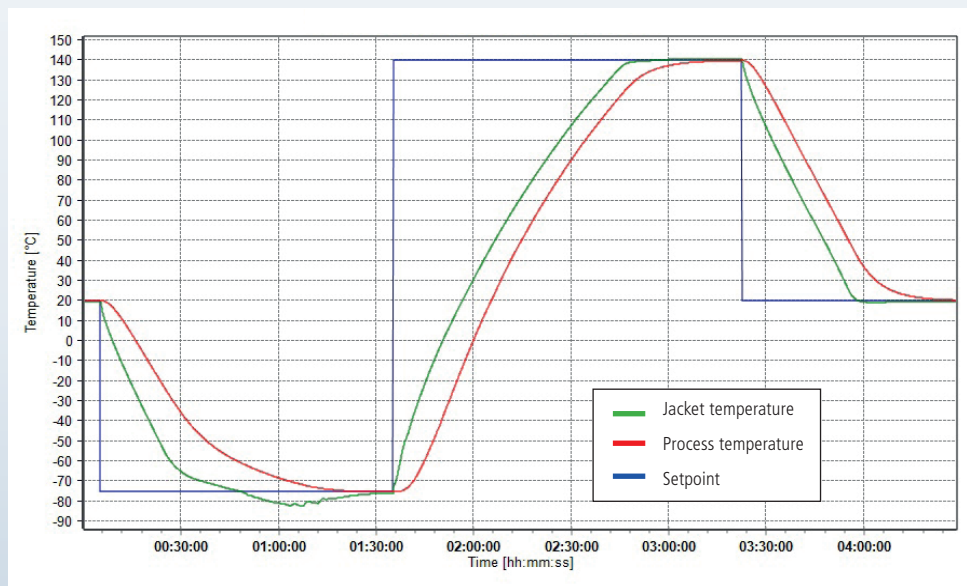
Temperature range: -85°C...+250°C
 Heating power: 2.0 kW
 Hoses: 1,5 m metal insulated M30
 HTF: DW-Therm / Ethanol
 Reactor: Asahi 5 liter vacuum insulated
 Reactor content: 4.0 l DW-Therm
 Stirrer speed: 150 rpm
 Control: process
 Amb. temperature: +22°C

Results

1. Performance:

The graphic shows the speed, accuracy and stability as the Unistat 815w as it reaches and maintains each new set-point.

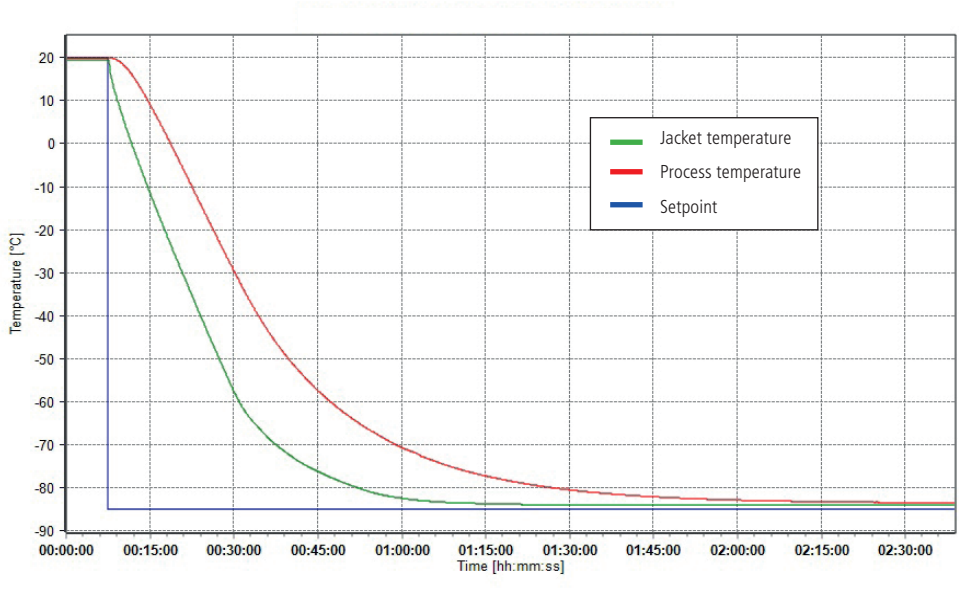
Start T	End T	Approximate Time	Av. Ramp Rate	Fastest Ramp Rate
+20°C	-75°C	76 minutes	1.2 K/min	(-10°C to -40°C) 2.7 K/min
-75°C	+140°C	98 minutes	2.2 K/min	(+30°C to +60°C) 3.0 K/min
+140°C	+20°C	72 minutes	1.7 K/min	(+70°C to +40°C) 3.0 K/min



2. Lowest achievable temperature (Tmin):

The graphic shows that the minimum achievable process temperature was -83.4°C*.

*with Ethanol as HTF



3. Stability:

The graphic shows the jacket being heated & cooled to hold the process mass exactly on the set-point with a stability of better than +/-0.02K at both -80°C and 20°C.

