

## Unistat® 912w

**Temperature control of the 100-liter Chemglass reactor**

### Requirement

This case study demonstrates the ability of the Unistat 912w to control the process temperature in a Chemglass 100-litre glass jacketed reactor.

### Method

The Unistat and reactor were connected using two metal hoses M30. The reactor was filled with 78 liters of Ethanol. "Process" control was carried out via a Pt100 sensor located in the process mass. Stirrer speed was set to 65 rpm.

### Setup details

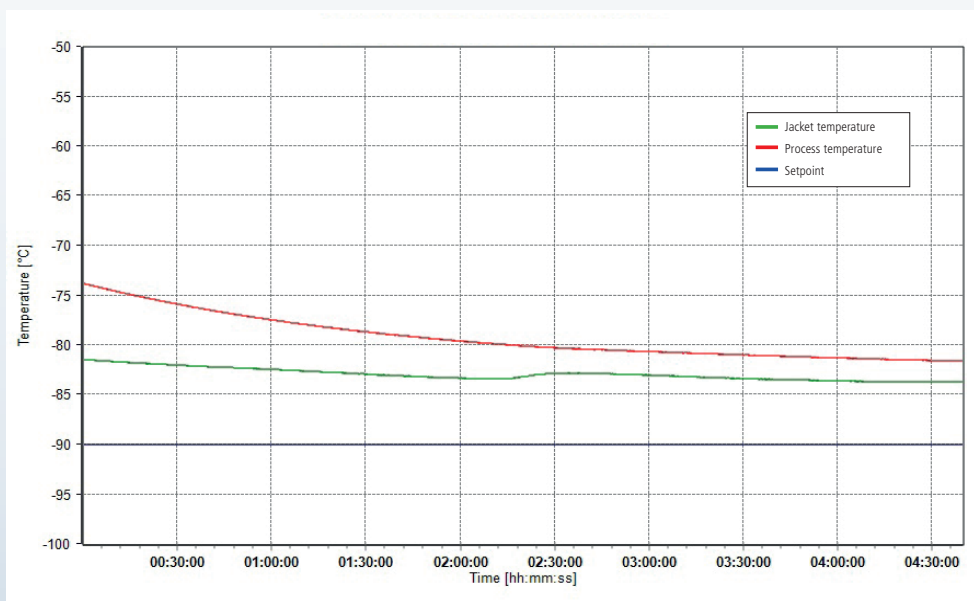
Temperature range:	-90 ... +250°C
Cooling power:	7,0 kW @ 0°C
	7,0 kW @ -20°C
	6,0 kW @ -40°C
Heating power:	6,0 kW
Hoses:	2 x M30 metal Insulated
HTF:	DW-Therm
Reactor:	100 litres glass jacketed
Reactor content:	78-liters Ethanol
Reactor stirrer speed:	65 rpm
Control:	Process
Amb. temperature:	+25°C



## Results

### 1. Lowest achievable temperature (Tmin):

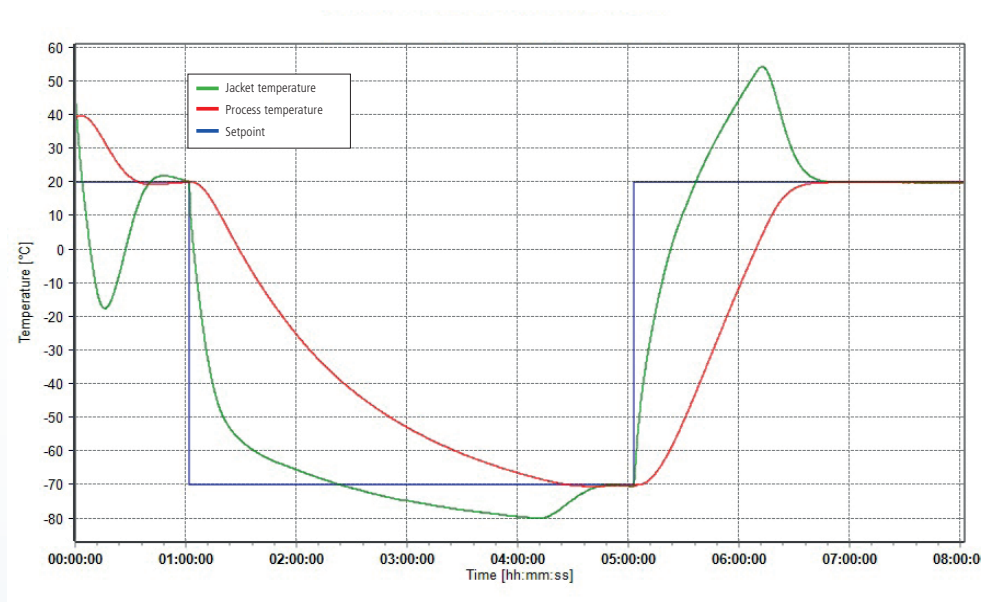
The graphic shows the minimum achievable process temperature to be -81.6°C.



## 2. Performance:

The table and the graphic shows the speed, accuracy and stability as the process is changed to each new set-point.

Start T	End T	Approximate time	Av. Ramp Rate	Fastest Ramp Rate
+20°C	-70°C	205 minutes	0.4 K/min	(+10°C to -20°C) 0.7 K/Min
-70°C	+20°C	104 minutes	0.9 K/min	(-20°C to +10°C) 1.9 K/Min



## 3. Stability:

The table and the graphic shows tight and absolute stable control with the jacket temperature being continually adjusted to hold the process temperature rock-steady at both temperatures: at 20°C and -40°C.

