



# Unistat 825

**Unistat 825 cycling a 20-litres glass jacketed reactor**

**Requirement**

This case study determines the lowest achievable process temperature and the ability of the Unistat 825 to control the process temperature when it is connected with an uninsulated 20-litre Chemglass jacketed reactor.

**Method**

The 20-litres Chemglass jacketed reactor was connected to Unistat 825 using metal insulated hoses M24 and two M30 to M24 adaptors. The thermofluid used in the system was "DW-Therm". "Process" control was carried out via a Pt100 sensor located in the "process" mass. Stirrer speed was set to 100 rpm.

**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: metal insulated M24
- HTF: DW-Therm
- Reactor: 20 l Chemglass jacketed reactor
- Reactor content: 15 l DW-Therm
- Stirrer speed: 100 rpm
- Control: process
- Amb. temperature: +25°C

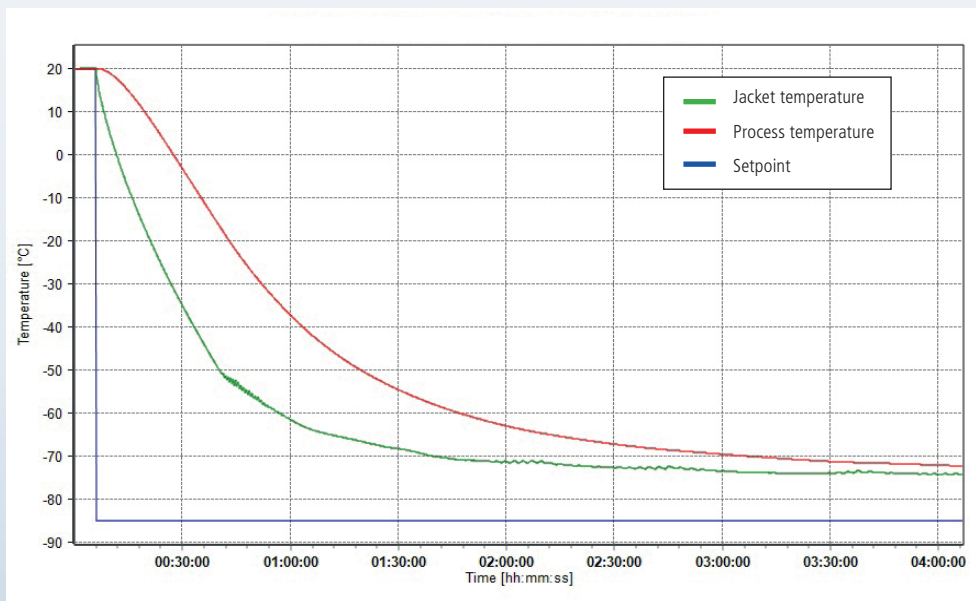
**Video clip**

<https://youtu.be/wRlzdng7uv8>

**Results**

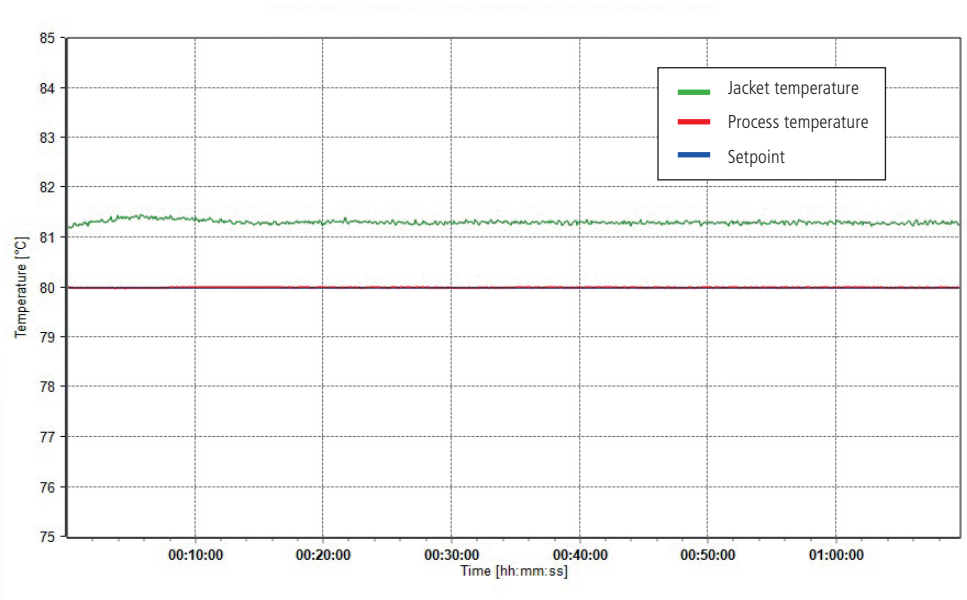
**1. Lowest achievable temperature (Tmin):**

As the graphic shows, a process temperature of -72.3°C was reached.



## 2. Stability:

As the graphic shows, the Unistat 825 is able to hold the process temperature in a Chemglass 20-litre uninsulated jacketed reactor stable at 80°C.



## 3. 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	-60°C	110 minutes	0.7 K/min	(+10°C to -20°C) 1.3 K/min
-60°C	+100°C	66 minutes	2.4 K/min	(+30°C to +60°C) 2.7 K/min
+100°C	+20°C	50 minutes	1.6 K/min	(+60°C to +30°C) 1.8 K/min

