

# Unistat 825

**Unistat 825 cycling a 5-liter vacuum insulated reactor**

**Requirement**

This case study demonstrates the minimum achievable process temperature and the control capabilities over the process temperature when a Unistat 825 is connected with an Asahi 5-liter vacuum insulated reactor.

**Method**

The Asahi 5-liter vacuum insulated reactor was connected to Unistat 825 using metal insulated hoses M24. 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 150 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: 5 l Asahi vacuum insulated reactor
- Reactor content: 4 l DW-Therm
- Stirrer speed: 150 rpm
- Control: process
- Amb. temperature: +23°C

**Video clip**

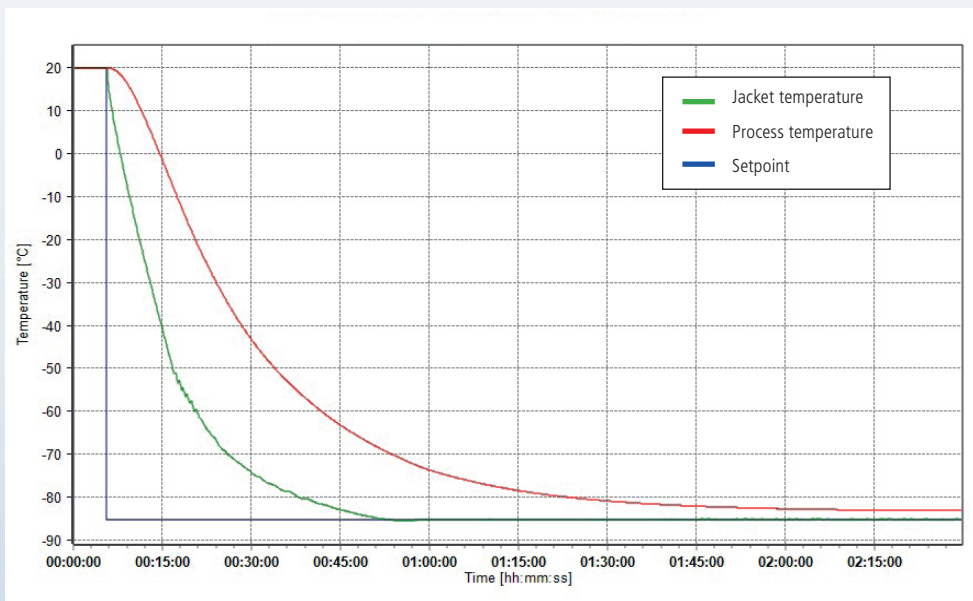
<https://youtu.be/EumZLCCMixk>



**Results**

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

The graphic shows that the minimum achievable process temperature was -83°C.



## 2. Performance:

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	Fastest Ramp Rate
+20°C	-75°C	65 minutes	1.5 K/min	(+10°C to -10°C) 2.9 K/min
-75°C	+100°C	38 minutes	4.6 K/min	(+30°C to +60°C) 7.5 K/min
+100°C	+20°C	31 minutes	2.6 K/min	(+60°C to +30°C) 5 K/min

