

# Unistat 405

## Unistat 405 controlling 2-litres glass-jacketed Asahi reactor

### Requirement

This case study demonstrates the ability of the Unistat 405 to control the temperature of the reaction mass in a 2-litres glass-jacketed reactor from Asahi between -40°C and +25°C. The graphics show the speed, accuracy and stability of the Unistat 405 as each new set-point is reached.

### Method

Asahi 2-litres reactor was connected to Unistat 405 using two M16x1 flexible hoses. The thermofluid used in the system was M40.165/220.10. "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: -45°C...+250°C
- Cooling power: 1.00 kW @ +100°C  
1.00 kW @ 0°C  
0.60 kW @ -20°C  
0.15 kW @ -40°C
- Heating power: 3.0 kW
- Hoses: M16 x 1,0 m
- Thermofluid: M40.165/220.10
- Reactor: Asahi 2-litres reactor
- Reactor content: Methanol (1 l)
- Stirrer speed: 150 rpm
- Control: Process
- Amb. temperature: +25°C

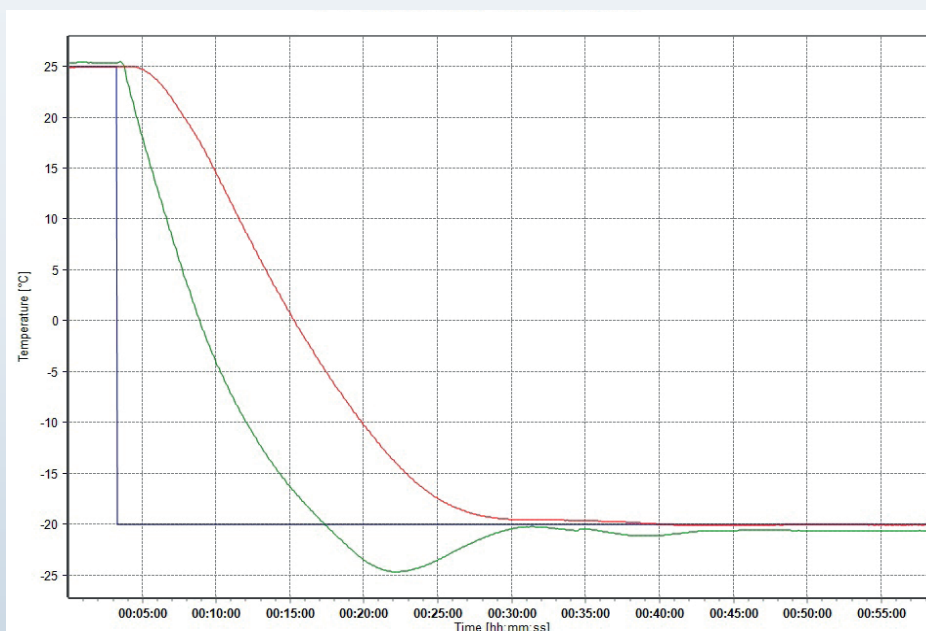


## Results

### 1. Performance:

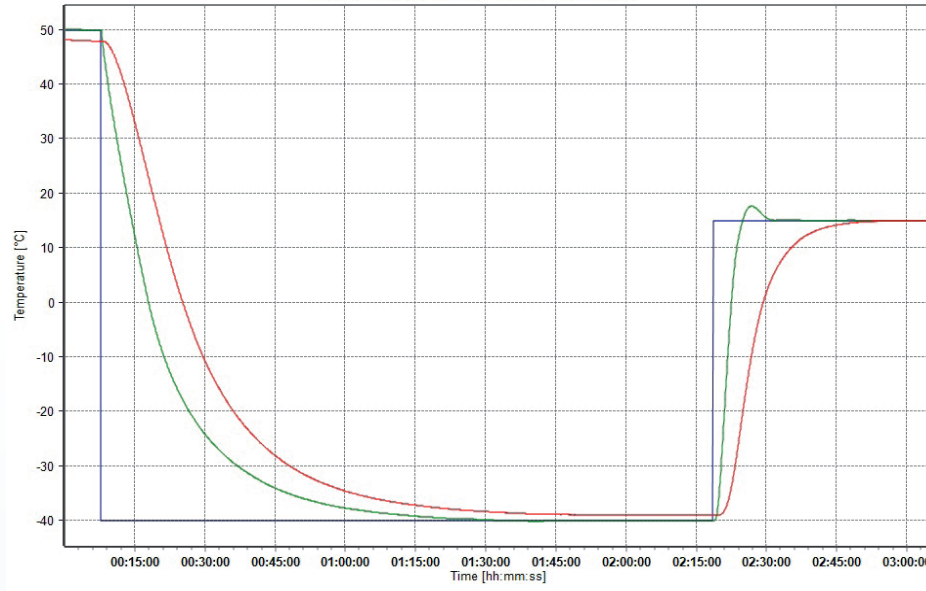
The graphics show the speed, accuracy and stability of the Unistat 405 as each new set-point is reached.

Start T	End T	Time Taken	Av. Ramp Rate
+25°C	-20°C	35 Minutes	1.3 K/min
-39°C	+15°C	35 Minutes	1.5 K/min



## 2. Lowest achievable temperature (Tmin, Process mass):

The graphic shows that the minimum achievable process temperature was -39.0°C.



## 3. Stability:

The graphic shows the temperature stability of +/-0.02K at +20°C.

