



## CC-510

### CC-510 cycling a 5-litres glass vacuum insulated reactor

#### Requirement

This Case Study demonstrates the speed and accuracy of the temperature control, also the minimum achievable process temperature when a CC-510 is connected together with an Asahi 5-litre vacuum insulated reactor over the temperature range -30°C to +100°C.

#### Method

The 5-litres Asahi glass vacuum insulated reactor was connected to CC-510 using M16 metal insulated hoses. 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.

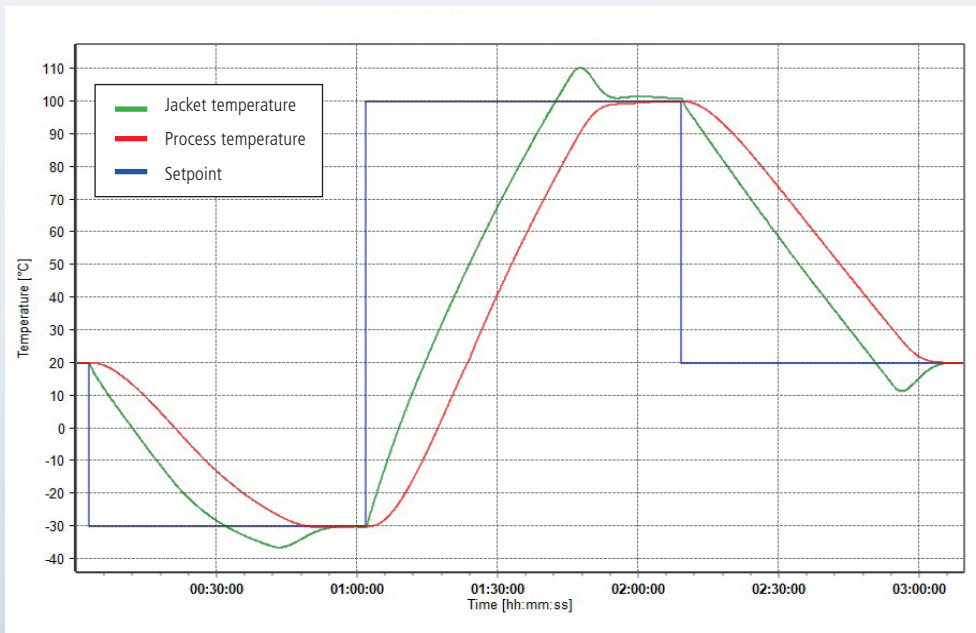
#### Setup details

Temperature range:	-50°C...+200°C
Cooling power:	2.1 kW @ +20°C
	2.1 kW @ 0°C
	1.0 kW @ -20°C
Heating power:	3.0 kW
Hoses:	2*M16 metal insulated
HTF:	DW-Therm
Reactor:	Asahi 5-litres glass vacuum insulated
Reactor content:	4 l DW-Therm
Stirrer speed:	150 rpm
Control:	process
Amb. temperature:	+25°C

## Results

### 1. Performance:

The graphic shows the CC-510 reaching and maintaining each new set point. It takes approximately 45 minutes to cool down the reactor from +20°C to -30°C. In the heat up phase CC-510 takes 60 minutes to heat the reactor from -30 °C to +100 °C and then it takes 54 minutes to cool down the reactor once more from +100°C to +20°C.



## 2. Lowest achievable temperature (Tmin):

Once stable at +20°C under the "Process" control, a set point of -50°C is entered. The graphic shows that a minimum process temperature of -46.5°C was reached.

