Unistat® 925w

Temperature control of the 100l glass jacketed reactor from Chemglass

Requirement
This case study demonstrates the ability of the Unistat 925w to control a 100l glass jacketed reactor from the company Chemglass.

Method
The Unistat and reactor were connected using metal hoses M30. The reactor was filled with M80.100/250.06. Stirrer speed was set to 100 rpm.

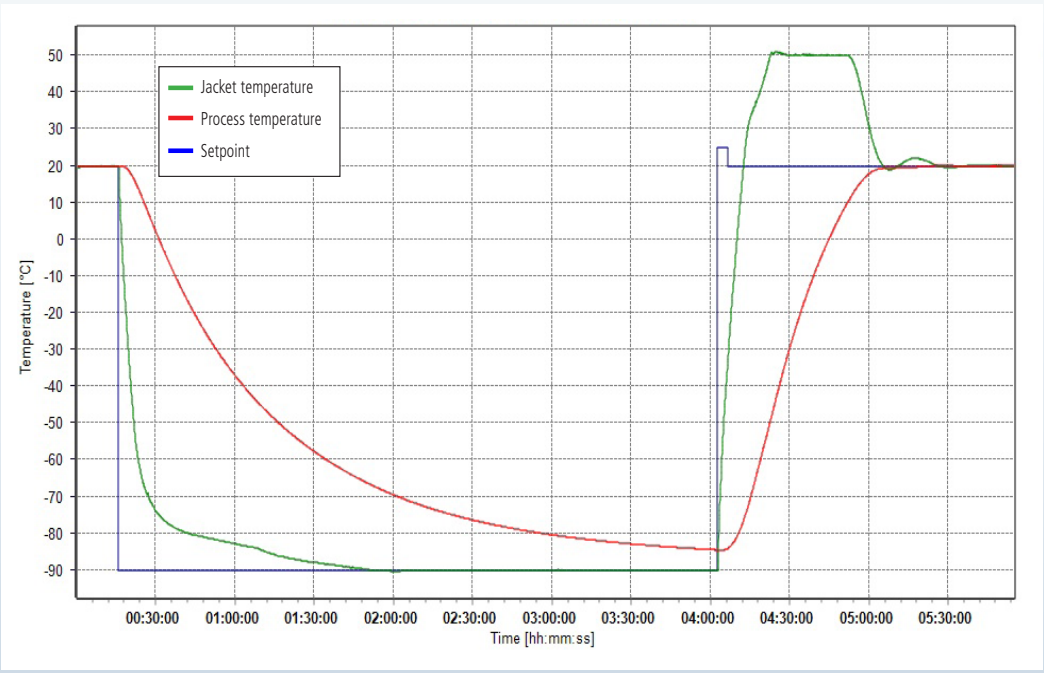
Setup details

Temperature range:	-90 … +250°C
Cooling power:	16,0 kW @ 0°C
	16,0 kW @ -20°C
	15,0 kW @ -40°C
Heating power:	12,0 kW
Hoses:	1 x M30 x metal Insulated
HTF:	M90.055/170.02
Reactor:	100l glass jacketed
Reactor content:	70l M80.100/250.06
Reactor stirrer speed:	100 rpm
Control:	Process
Amb. temperature:	+23°C

Results:

1. Lowest achievable temperature in the reaction mass:
The graphic below shows that the minimum achievable temperature of the process mass was -84.5°C.
To bring the process mass from -84.5°C back to +20°C took 76 minutes at a rate of 1.4 K/min.

Start T	End T	Time taken	Av. Ramp Rate
+20°C	-84.5°C	228 minutes	0.5 K/Min
-84.5°C	+20°C	76 minutes	1.4 K/min

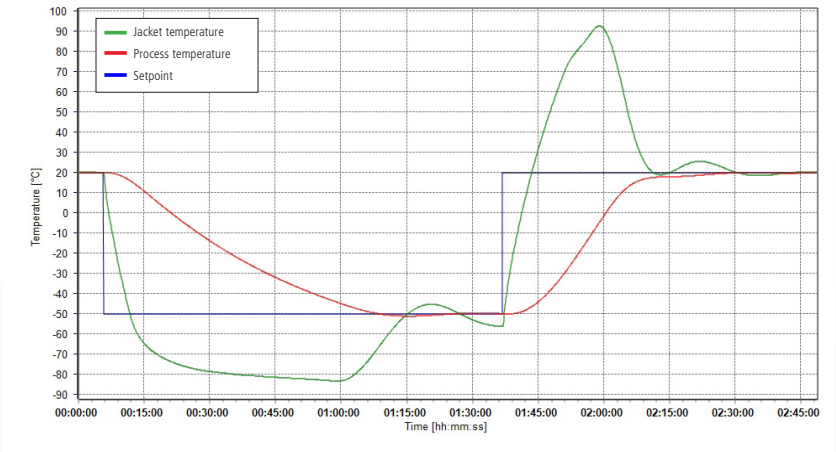


2. Performance:

Temperature Control from +20°C to -50°C and back to +20°C

The graphics below demonstrate the speed, accuracy and stability of control as the Unistat 925w cycles the process mass between +20°C and -50°C.

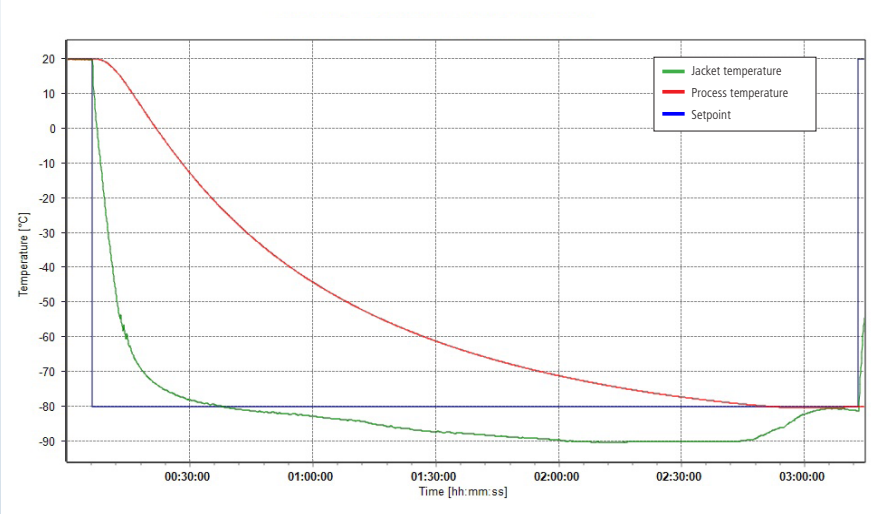
Start T	End T	Time taken	Av. Ramp Rate
+20°C	-50°C	64 minutes	1.1 K/Min
-50°C	+20°C	51 minutes	1.4 K/min



Temperature Control from +20°C to -80°C

The graphics below demonstrate the speed, accuracy and stability of control as the Unistat 925w cycles the process mass between 20°C and -80°C.

Start T	End T	Time taken	Av. Ramp Rate
+20°C	-80°C	166 minutes	0.5 K/Min



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