Unistat® Tango

Unistat Tango controlling a 6l QVF reactor

Requirement
The graphics illustrate the performance of Unistat Tango working with a 6l QVF reactor.

Method
The Unistat and reactor are connected using two 1,5-metre insulated metal hoses. The reactor is filled with SilOil M40.165/220.10.

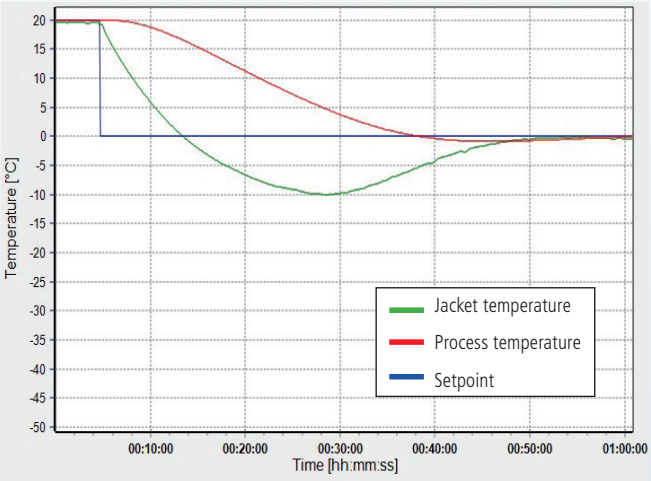
Setup details

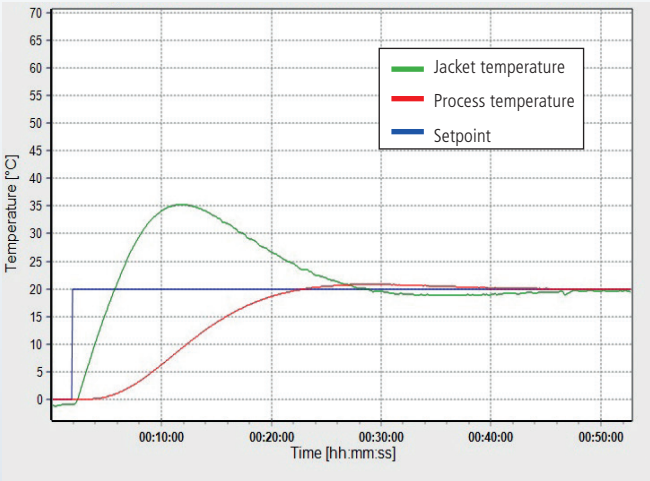
Temperature range:	-45 … +250 °C
Cooling power:	0,70 kW @ 0 °C
	0,40 kW @ -20 °C
	0,40 kW @ -30 °C
Heating power:	1,5 kW
Hoses:	M24 x 1,5 m
HTF:	SilOil M40.165/220.10
Reactor:	6-litre glas reactor
Reactor content:	5l M40.165/220.10
Reactor stirrer speed:	260 rpm
Control:	Process

Results

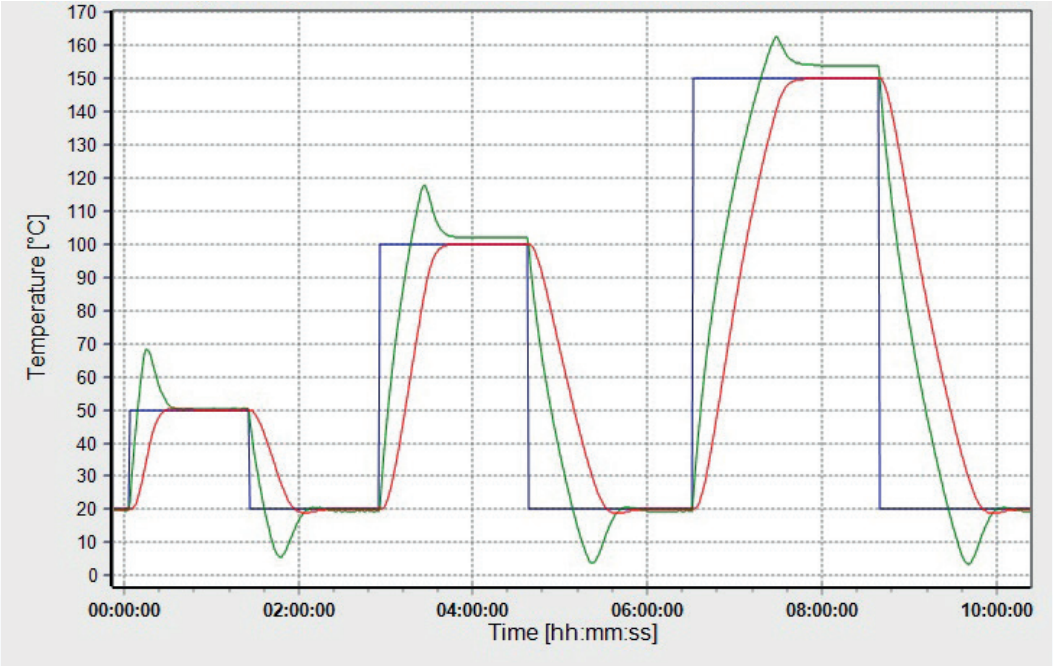
Temperature control of the reactor between 0 °C and +20 °C:
It can be seen from the graphic how quickly the jacket ramps creating a wide difference in temperature between the jacket and process in the initial cool down phase. Around 33 minutes after the start 0 °C could be reached as process temperature.

In the heat up phase the Unistat Tango takes 21 minutes to heat the 6-litres reactor from 0 °C to +20 °C. The heating rate of 0,95 K/min can be seen on the process temperature curve.





Temperature control of the reactor in a temperature range from +20 °C to +150 °C:
The graphic shows the time taken to cool down and heat up the process in a temperature range from +20 °C to +150 °C.
The table given below shows the various time taken to cool down and heat up the process in a different temperature ranges.



Ramps / Set point	Time to reach Set-point
+20°C to +50°C	25 min
+50°C to +20°C	32 min
+20°C to +100°C	51 min
+100°C to +20°C	55 min
+20°C to +150°C	1h 22 min
+150°C to +20°C	1h 12 min