huber

Setup details
Unistat® 830 & Buchi Glas Uster reactor

Temperature range:	-85...200 °C
Cooling power:	3.6 kW @ 0 °C
	2.2 kW @ -60 °C
	3.6 @ 0 °C
	3.5 @ -20...-40 °C
	2.2 @ -60 °C
	0.7 @ -80 °C
Pump speed:	3500 rpm
Heating power:	3 kW
Hoses:	2x1.5 m; M38x1.5 (#9616)
HTF:	DW-Therm (#6479)
Reactor:	20-litre jacketed glass reactor
Reactor contents:	15 litre M90.055.03 (#6259)
Reactor stirrer speed:	70 rpm
Control:	process

Unistat® 830

Controlling simulated exothermic reactions in a Buchi Glas Uster 20-litre glass reactor at -40 °C

Requirement
This case study is to see the response of a Unistat 830 controlling simulated exothermic reactions in a Buchi Glas Uster 20-litre reactor at -40 °C:
1.)   50 Watt (43 kcal / hr)
2.) 100 Watt (86 kcal / hr)
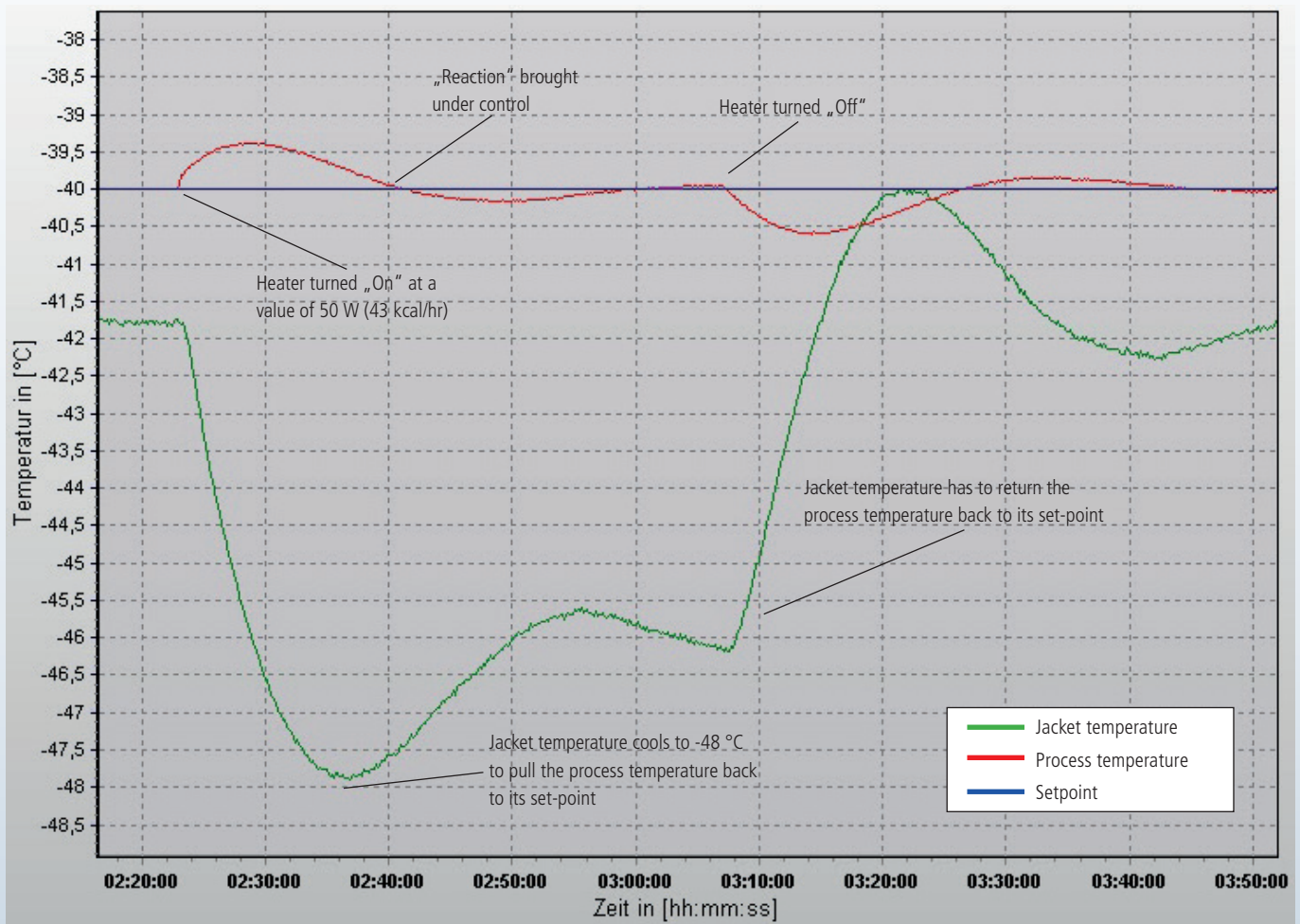3.) 150 Watt (129 kcal / hr)

Method
The Unistat and reactor are connected using two 1.5-metre insulated metal hoses. The reactor is filled with 15 litre of "M90.055.03", a Huber supplied silicon based HTF. The exothermic reactions are simulated using a controlled electric immersion heater.
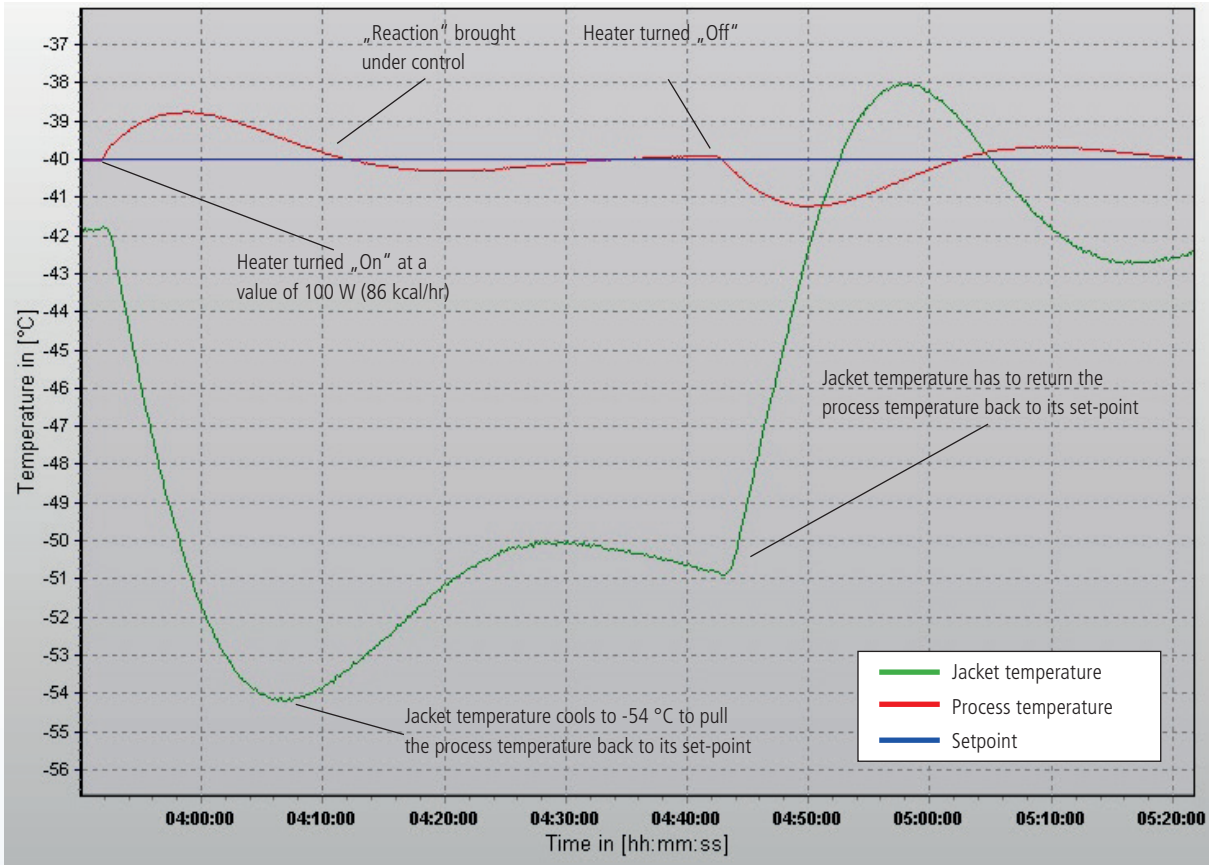
Results
In each case the jacket temperature responds immediately to return the process temperature to its set-point and maintain exactly the set-point during the "exotherm".

1.) 50 W (43 kcal / hr)

Graph: Temperatur in [°C] (y-axis) vs Zeit in [hh:mm:ss] (x-axis)

Annotations on graph:
- "Reaction" brought under control
- Heater turned "Off"
- Heater turned "On" at a value of 50 W (43 kcal/hr)
- Jacket temperature has to return the process temperature back to its set-point
- Jacket temperature cools to -48 °C to pull the process temperature back to its set-point

Legend:
- Jacket temperature
- Process temperature
- Setpoint

2.) 100 W (86 kcal / hr)

3.) 150 W (129 kcal / hr)