# Unistat® 610w

**Cooling a Buchi Glas Uster 20-litre jacketed glass reactor to $T_{min}$**

**Requirement**
This case study shows the performance of a Unistat 610w with cooling a Buchi Glas Uster 20-litre reactor from 20 °C to -60 °C. M38x1.5 hoses are used in order to get a higher HTF flow rate to the reactor jacket to achieve more efficient heat transfer characteristics.

**Method**
M30x1.5 hoses are used to connect the set-up and the working fluid is DW Therm.

**Results**
The "internal" (jacket) temperature takes 29 minutes to reach the minimum possible temperature of -59.5 °C. It pulls down the process temperature at a rate of 1.1 K/min. After 65 minutes there is a temperature difference of 6 K between the jacket and process temperatures.
For a machine of 0.8 kW of cooling power at -60 °C, the ramp rate is very fast considering the size of the reactor.

**Setup details**
Unistat® 610w & Buchi Glas Uster reactor

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|---|---|
| Temperature range: | -60...200 °C |
| Cooling power: | 7.0 kW @ 200…0 °C<br>6.4 kW @ -20 °C<br>3.3 kW @ -40 °C<br>0.8 kW @ -60 °C |
| Heating power: | 6.0 kW |
| Hoses: | 2x1.5 m; M38x1.5 (#6656) |
| HTF: | DW-Therm (#6479) |
| Reactor: | 20-litre jacketed glass reactor |
| Reactor content: | 15 litre DW-Therm (#6479) |
| Stirrer speed: | 70 rpm |
| Control: | internal |