

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

Temperature range:	-60...200 °C
Cooling power:	7.0 kW @ 200...0 °C 6.4 kW @ -20 °C 3.3 kW @ -40 °C 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

