

Unistat® 912w

Unistat® 912w cycling a 63 litre De Dietrich jacketed reactor

Requirement

This case study demonstrates the ability of Unistat 912w to cycle the process temperature in a range from +20°C to -50°C, the closeness of the temperature control and the minimum process temperature achievable in the process mass.

Method

The 63 litre De Dietrich reactor was connected to Unistat 912w using two M30x1.5 1-meter flexible hoses. The reactor was filled with 42 litres of Ethanol as a thermal load. The heat transfer fluid used in the system was M90.055.03. "Process" control was carried out via a Pt100 sensor located in the process mass. Stirrer speed was set to 85 rpm.

Setup details

Temperature range:	-90°C...+250°C
Cooling power:	7.0 kW @ +250°C 7.0 kW @ +200°C 7.0 kW @ +100°C 7.0 kW @ 0°C 7.0 kW @ -20°C 7.0 kW @ -40°C 3.5 kW @ -60°C 0.9 kW @ -80°C
Heating power:	6.0 kW
Hoses:	M30x1.5; 2* 1 m
HTF:	M90.055.03
Reactor:	De Dietrich 63 litre jacketed reactor
Reactor content:	42 litre Ethanol
Stirrer speed:	85 rpm
Control:	process



Results

Performance:

It can be seen from the graphic how quickly the Unistat creating a wide temperature difference between the jacket and the process fluids. With the wide ΔT the Unistat enables a rapid cool down of the process temperature from +20°C to -50°C in approximately 65 minutes.

Lowest achievable temperature (T_{min}):

Once stable at +20°C under "Process" control, a set-point of -90°C is entered. The Unistat cools the reactor down to the minimum achievable process temperature of -76°C.

