

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 +80°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 has a nominal capacity of 63 litres but the jacket design allows thermal transfer for a filling volume of 80 litres. For the measurements in this case study the reactor was filled with 80 litre Ethanol as a thermal load. The thermofluid used in the system was "M90.055.03". "Process" control was carried out via a Pt100 sensor located in the "process" mass.

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:	80 litre Ethanol
Stirrer speed:	85 rpm
Control:	process



Results

Performance:

The following heating up and cooling down curves demonstrates the performance of the Unistat 912w. For heating up from -70°C to +80°C the Unistat needs approximately 60 minutes. To cool down the reactor from +80°C to -50°C the Unistat needs only approximately 80 minutes and another 36 minutes to heat it up again to +20°C.

Cool down in a very wide temperature range:

Once stable at +80°C under "Process" control, a set-point of -70°C is entered. The Unistat 912w needs approximately 3 hours and 20 minutes to cool down the overloaded reactor with a content of 80 liters to the new set-point temperature.

