Unistat® 912w

Unistat® 912w cycling a 50 litre Chemglass jacketed reactor

Requirement

This case study demonstrates the ability of Unistat 912w to cycle the process temperature in a range from +20°C to -60°C, the closeness of the temperature control and the minimum process temperature achievable in the process mass.

Method

The 50 litre Chemglass reactor was connected to Unistat 912w using two M30x1.5 1-meter flexible hoses. The thermofluid 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:	Chemglass 50 litre jacketed reactor
Reactor content:	37 litre M90.055.03
Stirrer speed:	85 rpm
Control:	process

Results

Performance:
Cooling down and heating up in a range from +20°C to -60°C. The Unistat 912w needs approximately 82 minutes to cool down the reactor from +20°C to -60°C and 45 minutes to heat it up from -60°C to +20°C.

Lowest achievable temperature (T_{min}):
Once stable at +20°C under "Process" control, a set-point of -90°C is entered. The Unistat 912w cools the reactor down to the minimum achievable process temperature of approximately -75°C.