



Setup details

Unistat® 905w & Chemglass un-insulated glass jacketed reactor

Temperature range:	-90...250 °C
Cooling power:	3.6 kW @ 0 °C 2.2 kW @ -60 °C 0.7 kW @ -80 °C
Heating power:	6 kW
Hoses:	1x2 m; M30x1.5 (#6427) 1x1 m; M30x1.5 (#6426)
HTF:	M90.055.03 (#6259)
Reactor:	50-litre un-insulated jacketed glass reactor
Reactor contents:	34.5 litre M90.055.03 (#6259)
Reactor stirrer speed:	100 rpm
Control:	process

Unistat® 905w

Unistat® 905w cooling a 50-litre Chemglass un-insulated glass jacketed reactor to T_{min}

Requirement

The Unistat 905w is designed to operate with smaller reactors (15 to 20 litre) at low temperatures. This case study looks at how low the Unistat 905w can cool the process temperature to inside a relatively larger, un-insulated 50-litre glass jacketed reactor.

Method

The reactor was filled with 34.5 litre of M90.055.03 as a thermal load. The stirrer was set to 100 rpm and the control set to "Process". The results were recorded using the Huber "SpyLight" software. The HTF (heat transfer fluid) used was M90.055.03.

Results

It can be seen from the graphic how quickly the jacket ramps creating a wide difference in temperature between the jacket and process in the cool down phase resulting in the jacket temperature reaching -79 °C with a corresponding process temperature of -72 °C.

The heat-up rate demonstrates the remarkable level of control with the jacket ramping to 91 °C to pull the process back towards 20 °C. As the process temperature approaches the target temperature the jacket rapidly cools to approximately 23 °C to bring the process to 20 °C in approximately 45 minutes.

