

Unistat® 930w

Thermal shock protection shown on a Diehm 100-litre reactor

Requirement

This case study is designed to show the function of 'ΔT limit' in the controller and how it protects glass reactors against thermal shock. This Diehm glass reactor does not have a manufacturer's ΔT limit at all. We could see in our tests > 150 K ΔT.

Method

The Unistat and reactor are connected using two 1.5-metre insulated metal hoses. The reactor is filled with 75 litre of "M90.055.03", a Huber supplied silicon based HTF.

Results

A standard user defined feature in the Unistats is the "ΔT limit" which limits the difference in temperature between the process and reactor jacket. It is set by the user to a value recommended by the reactor manufacturer. The default setting is 100 K.

The process temperature ramps at a rate of 3.53 K/min. and reaches the set-point in 47 minutes. Meanwhile the cooling ramps at a rate of 2.3 K/min. and takes 53 minutes to reach 20 °C.

Throughout the whole process the reactor is protected.

Setup details

Unistat® 930w & Diehm reactor

Temperature range:	-90...200 °C
Cooling power:	19 kW @ 200...100 °C 20 kW @ 0...-40 °C
Heating power:	24 kW
Hoses:	2x1.5 m; M38x1.5 (#6656)
HTF:	DW-Therm (#6479)
Reactor:	100-litre un-insulated glass reactor VPC Bypass installed
Reactor content:	75 litre M90.055.03 (#6259)
Stirrer speed:	400 rpm
Control:	process

