

PCHE Installation & Operation Guidance Notes

Performance Monitoring

PCHEs are compact, high integrity, plate type heat exchangers suitable for use with relatively clean fluids and are capable of handling extremes of pressure and temperature. To ensure their continued trouble-free performance, the following instrumentation should be installed and monitored:

- 1) coolant control valve position
- 2) coolant pressure
- 3) pressure drops across the PCHE for all streams
- 4) inlet & outlet temperatures for all streams
- 5) flow rates for all streams
- 6) pressure drops across the strainers for all streams

These instruments should be monitored as part of plant condition monitoring. The pressure drops across strainers should be monitored regularly and the rest from time to time or whenever commissioning or modifications are being carried out.

Coolant Control Valve Position. A PCHE core responds very rapidly to changes in operating conditions whereas the solid margins around the core respond more slowly. This means that unstable operation can give rise to damaging thermal cycles leading to fatigue and inter-stream leakage. Monitoring the coolant controller output allows you to determine that the coolant control system is stable while in normal operation. **Monitoring the control output is only satisfactory if the valve and its positioner have been inspected and calibration checked.**

Heatric recommends that the coolant control valve be set to manual during commissioning and while carrying out modifications. Before the valve is to be set to automatic, after commissioning or modification work is completed, the valve should be physically inspected (including its linkages) and the controller properly tuned. The output should be monitored from time to time to ensure that any short term fluctuations are kept to about 5% of the target flow.

When monitoring the coolant controller output, trend the data every 15 - 30 seconds for about 2 hours. **Do not average the data** - this can hide instability. If there is any instability, tune the system until it is suppressed. Remember, compact exchangers react much more quickly than temperature transmitters so keep proportional bands sufficiently large and reset times long.

Coolant Pressure allows you to check that the pressure is above its saturation pressure at the gas inlet temperature so that boiling cannot occur. Boiling the cooling medium can lead to corrosion from scale deposition or instability leading to thermal fatigue.

PCHE Pressure Drops, Inlet & Outlet Temperatures and Flow Rates for all streams will enable you to check that the PCHE is operating as it should and not becoming fouled. Heatric 'offdesign' utility can be used to check the performance. If you do not have a copy of 'offdesign', please let us know and we will be happy to send it to you.

Pressure Drops across Strainers will tell you whether the strainers are filling up and require cleaning. Monitor the pressure drops across the strainers regularly. A zero pressure drop means that the strainer has burst and will require replacing. If this is the case, the PCHE will also require cleaning. An increasing pressure drop means that the strainer will require cleaning. Depending on how clean the system is prior to commissioning, the strainers may have to be cleaned regularly. Do not remove them if this is the case - they are protecting the equipment, including the PCHE.

If you would like further information or assistance in reviewing your performance monitoring, please contact Heatric telephone number +44 (0)1202 627000 or email aftersales@heatric.com.