

Pi^π Sample Cooler

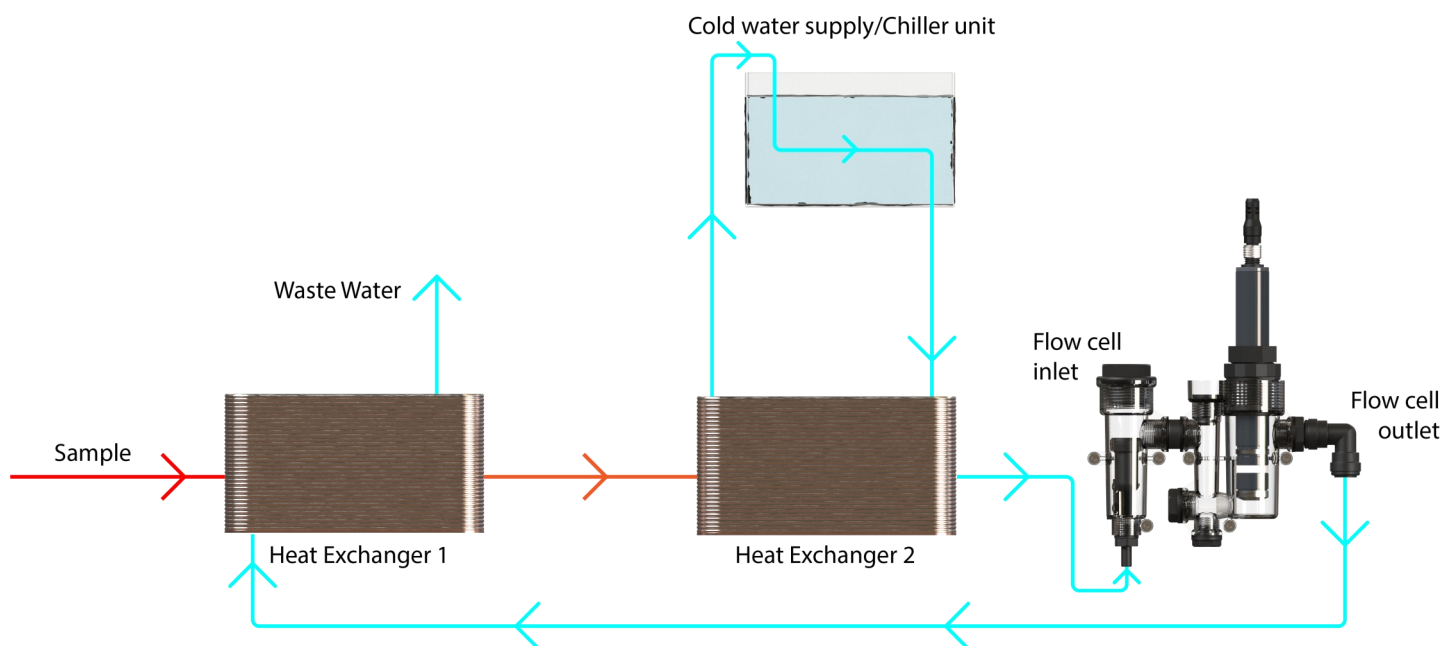
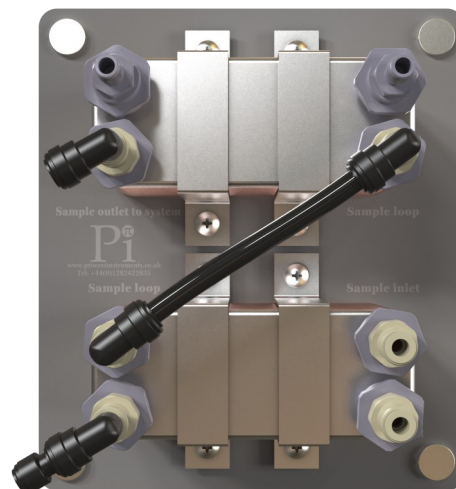
Introduction

Some sensing technologies can only work up to a given temperature. For those wishing to measure an online sample above that temperature, a sample cooler is required. Most sample coolers use a considerable amount of water and for those companies wishing to reduce their water usage, this can be problematic.

In response to this difficulty, Pi has developed a two step sample cooling system which utilizes a closed loop thereby minimizing water use.

Principle of Operation

The sample cooler from Pi employs the principle of thermodynamics, whereby heat from a hot sample is exchanged to a colder sample. Going through two heat exchanges, the sample is firstly 'pre-cooled' by the outlet from the sensor flow cell, reducing it to a safer operating temperature. This cooled sample would then typically go to drain, resulting in wasted energy. However, this sample cooler uses the pre-cooled sample to reduce the inlet sample's temperature too, reducing the potential wasted energy. Once 'pre-cooled', the sample is then cooled to it's final temperature by this heat exchange. The completion of cooling is aided by an industrial chiller^[1], which actively cools the sample to a set temperature.



Sample Cooler Operation Diagram

Results

The Pi sample cooler is capable of reducing a sample flow of 0.5L/min⁻¹ from 75°C (167°F) < 40°C (104°F), making it suitable for use on most 'hot' samples.

[1] Industrial chiller must be sourced and supplied by the customer

Specification*

Sample Cooler Dimensions:	290mm x 328mm
Wetted Materials:	316 Stainless Steel, 99.9% Copper brazing
Sample volume:	
Max Pressure:	3 Bar (43.5psi)
Sample Temperature Range:	75°C (167F) < 40°C (104F)
Maximum Inlet Sample Temperature:	< 75°C

Industrial Chiller Recommendations

Recommended Industrial Chiller Model Numbers:	CW-5200TH, CW-5200DH for 110VAC
Recommended Maximum Ambient Temperature:	45°C (please check sourced unit for it's own specified value)
Max Flow:	13L/min

** All subject to change without notice*