BYU UO Lab Plate Heat Exchangers

Inventory	Model	Surface Area (m^2)	Plate length	K: 2->4	K: 3->1
1	B3-12A-10ST	0.12	7.5”	209	102
2	B3-12A-40	0.48	7.5”	9.65	8.93
2	B3-23A-20ST	0.46	12”	42.8	36.4
1	B3-23A-40	0.92	12”	12.5	13.1

There are six plate heat exchangers in the UO lab. They are designed for counter current flow with flow direction of Inlet 2 to Outlet 4 and Inlet 3 to Outlet 1 as indicated in the figure. The head loss can be calculated from the K factors in the table where the head loss is equal to the product of the K value and the ratio of the squared velocity to two times the gravitational constant with the velocity determined from the volumetric flow and a diameter of 3/4 inches NPS (0.824 in ID).

An overall heat transfer coefficient ranges from 2000-4000 $W/m^2/K$ depending on the flow rate with an approximate correlation of
U = 1(Reynolds/noplates) + 1800*
in $W/m^2/K$, where the Reynolds number is based on the smallest flow of either side through a ¾ inch pipe (0.824 inch ID) and noplates is the number of plates in the exchanger (10, 20, or 40 as indicated by the last number in the model).