

SINGLE PHASE - DESIGN

DThermX

HEAT EXCHANGER: 4TMx30

Date: 19/10/2021

SSP Alias: 4TM

DUTY REQUIREMENTS

		Side 1		Side 2
Fluid		Water		Water
Flow type			Counter-Current	
Circuit		Inner		Outer
Heat load	kW		14.00	
Inlet temperature	°C	60.00		51.30
Outlet temperature	°C	56.29		55.00
Flow rate	kg/s	0.9013		0.9036
Pressure drop (Design PD)	kPa	96.3 (100.00)		99.4 (100.00)
Thermal length		0.743		0.741

PLATE HEAT EXCHANGER

		Side 1		Side 2
Total heat transfer area	m ²		0.336	
Heat flux	kW/m ²		41.7	
Mean temperature difference	K		5.00	
O.H.T.C. (available/required)	W/m ² , °C		13900/8340	
Pressure drop - total*	kPa	96.3		99.4
- in ports	kPa	8.09		8.11
Port diameter (up/down)	mm	17.5/17.5		17.5/17.5
Number of channels per pass		14		15
Number of plates			30	
Oversurfacing	%		66	
Fouling factor	m ² , °C/kW		0.046	
Reynolds number		3831		3312
Port velocity (up/down)	m/s	3.81/3.81		3.81/3.81
Channel velocity	m/s	1.17		1.09
Shear stress	kPa	0.184		0.190
Average wall temperature	°C	56.28		55.18
Largest wall temperature difference	K		1.23	
Min./Max. wall temperature	°C	54.48/58.19		53.25/56.96

*Excluding pressure drop in connections.

PHYSICAL PROPERTIES

		Side 1		Side 2
Reference temperature	°C	58.14		53.15
Dynamic viscosity	cP	0.480		0.520
Dynamic viscosity - wall	cP	0.494		0.503
Density	kg/m ³	984.2		986.6
Heat capacity	kJ/kg, °C	4.184		4.182
Thermal conductivity	W/m, °C	0.6525		0.6472
Film coefficient	W/m ² , °C	38200		35300

TOTALS

		Side 1		Side 2
Total weight empty (no connections)*	kg		1.4	
Total weight filled (no connections)*	kg		1.66	
Hold-up volume (Inner Circuit)	dm ³		0.13	
Hold-up volume (Outer Circuit)	dm ³		0.14	
Port size F1/P1	mm		17.5	
Port size F2/P2	mm		17.5	
Port size F3/P3	mm		17.5	
Port size F4/P4	mm		17.5	
Carbon footprint	kg		9.8	