

File: D:\Users\...\10kW\HX10.EDR

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**Overall Summary**

<b>Calculation mode</b>		Design
<b>Exchanger type</b>		Standard axial flow
<b>Overall heat transfer calculated</b>	<b>kW</b>	26
<b>Overall surface area ratio</b>		1.3
<b>Mean temperature difference</b>	<b>°K</b>	0.81
<b>UA value of calculated duty</b>	<b>W/K</b>	32216.4
<b>Core length</b>	<b>mm</b>	1211.89
<b>Core width</b>	<b>mm</b>	559.1
<b>Number of layers per exchanger</b>		99
<b>Number of fins</b>		3
<b>Core depth(stack height)</b>	<b>mm</b>	612.9
<b>Number of exchangers in parallel</b>		1

**Overall Summary**

<b>Main stream number</b>		Stream 1	Stream 2
<b>Stream name</b>		11LPa>>9LPa	9HPa>>T5Ha
<b>Stream type</b>		Cold	Hot
<b>Flow direction</b>		End B to A (up)	End A to B (down)
<b>Number of layers per exchanger</b>		66	33
<b>Total mass flow rate</b>	<b>kg/s</b>	0.4555	0.4645
<b>Heat load</b>	<b>kW</b>	26	-26
<b>Percent of specified heat load</b>		100	100
<b>Area Ratio</b>		1.3	1.3
<b>Inlet temperature</b>	<b>°K</b>	8.09	18.86
<b>Outlet temperature</b>	<b>°K</b>	18.68	10.43
<b>Outlet temperature from input</b>	<b>°K</b>	18.68	10.43
<b>Inlet pressure</b>	<b>bar</b>	1.27076	19.395
<b>Outlet pressure</b>	<b>bar</b>	1.26756	19.39102
<b>Pressure drop (friction)</b>	<b>bar</b>	0.00321	0.00398
<b>Percent of allowed pressure drop</b>		98.73	19.88
<b>Allowed pressure drop</b>	<b>bar</b>	0.00325	0.02
<b>Estimated pressure drop</b>	<b>bar</b>	0.00325	0.02

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**Thermal Performance - Streams**

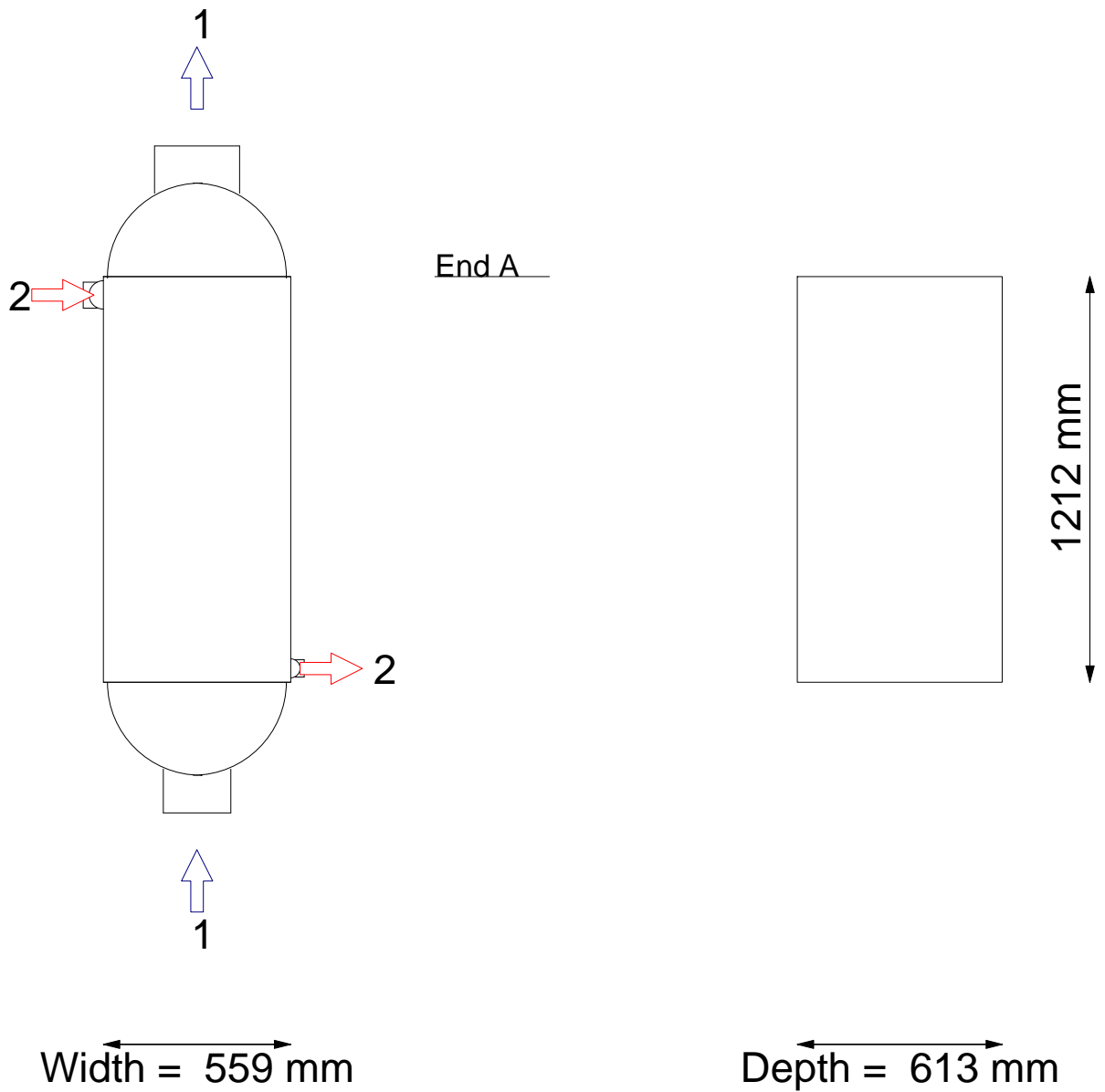
Main stream number		Stream 1	Stream 2
Stream name		11LPa>>9LPa	9HPa>>T5Ha
Flow direction		End B to A (up)	End A to B (down)
Total mass flow rate	kg/s	0.4555	0.4645
Heat load	kW	26	-26
Heat load per layer	kW	0.4	-0.8
Inlet temperature	°K	8.09	18.86
Outlet temperature	°K	18.68	10.43
Bubble point	°K		
Dew point	°K		
Inlet quality(vapor mass fraction)		1	1
Outlet quality(vapor mass fraction)		1	1
Inlet specific enthalpy	J/kg	54408	103720
Outlet specific enthalpy	J/kg	111479	47787
Fouling resistance	m <sup>2</sup> K/W	0	0
Minimum [T-Twall]	°K	0.1	0.09
Mean [T-Twall]	°K	-0.69	0.54
Mean heat transfer coefficient	W/(m <sup>2</sup> K)	254.4	499.4
Mean fin efficiency		0.64	0.8
Solution method		Design	Design
Heat load as fraction of maximum	-		
Theoretical maximum heat load	kW		

**Pressure Change - Streams**

	Stream 1	Stream 2
Stream name	11LPa>>9LPa	9HPa>>T5Ha
Inlet nozzle	bar -0.00013	-0.00102
Inlet distributor friction	bar -0.00001	-0.0004
Inlet distributor gravity	bar -0.00005	0.00021
Main fin friction	bar -0.00296	-0.00079
Main fin gravity	bar -0.00044	0.0063
Redistributor(s) friction	bar	
Redistributor(s) gravity	bar	
Outlet distributor friction	bar -0.00004	-0.00041
Outlet distributor gravity	bar -0.00003	0.00029
Outlet nozzle	bar -0.00007	-0.00135
Total friction	bar -0.00321	-0.00398
Total gravity	bar -0.00051	0.0068
Total acceleration	bar -0.00001	0
Pressure change (total)	bar -0.00321	-0.00398
Predicts pressure below minimum permitted		

Exchanger Diagram

Job Title:



**Exchanger - Overall Geometry**

Number of exchangers in parallel		1
Number of exchangers per unit		1
Number of layers per exchanger		99
Orientation		Vertical, end A at top
Core length	mm	1211.89
Core width	mm	559.1
Core depth(stack height)	mm	612.9
Number of X-flow passes		0
Number of layer groups		1
Distributor length - end A	mm	98.15
Main heat transfer length	mm	1043.88
Distributor length - end B	mm	69.86
Internal (effective) width	mm	536.1
Side bar width	mm	11.5
Parting sheet thickness	mm	1
Cap sheet thickness	mm	5
Exchanger metal		Aluminum
Exchanger weight - empty	kg	474.7
Exchanger weight - full of water	kg	859.8
Exchanger weight - operating	kg	485.7

**Exchanger - Fin Geometry**

		<b>Fin 1</b>	<b>Fin 2</b>	<b>Fin 3</b>
Fin code/bank number		2912	2	3
Fin used in exchanger		Yes	Yes	Yes
Fin type		Serrated (offset)	Perforated	Perforated
Fin height	mm	5.1	5.1	5.1
Fin thickness	mm	0.2	0.51	0.61
Fin frequency	#/m	1024	236	236
Fin porosity (fraction)			0.05	0.05
Fin serration length	mm	3.18		
Subchannel aspect ratio		6.31	1.23	1.24
Blockage fraction		0.24	0.21	0.25
Hydraulic diameter	mm	1.34	4.12	4.01
Flow area per unit width	mm	3.9	4.04	3.84
Primary perimeter per unit width		1.59	1.76	1.71
Secondary perimeter per unit width		10.03	2.06	2.01
Hydraulic diameter (hardway)	mm			
Flow area per unit width (hardway)	mm			

Exchanger - Layer Types - Layer A : 11LPa>>9LPa

Layer A

Number of layers 66                      Fraction double banked 1

Element type	Element identifier	Axial length mm	Distance from end A mm
1 End bar		11.5	11.5
2 Outlet distributor (stream) number	1	86.65	98.15
3 Main fin: fin number	2912	1043.88	1142.03
4 Inlet distributor (stream) number	1	58.36	1200.39
5 End bar		11.5	1211.89
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Exchanger - Layer Types - Layer B : 9HPa>>T5Ha

Layer B

Number of layers 33                      Fraction double banked 0

Element type	Element identifier	Axial length mm	Distance from end A mm
1 End bar		11.5	11.5
2 Inlet distributor (stream) number	2	86.65	98.15
3 Main fin: fin number	2912	1043.88	1142.03
4 Outlet distributor (stream) number	2	58.36	1200.39
5 End bar		11.5	1211.89
6			
7			
8			
9			
10			
11			
12			
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24			
25			

**Inlet Distributors**

		<b>Dist. 1</b>	<b>Dist. 2</b>
Stream number		1	2
Inlet distributor: Type		Full end	Indirect (side)
Inlet header location		Central	Left
Dimension a (axial length)	mm	58.36	86.65
Dimension b	mm	445.95	268.05
Inlet nozzle diameter	mm	202.74	77.92
Number of inlet nozzles/unit		1	1
Header diameter - inlet	mm	566.1	116.65
Fin code number for pad 1		2	3
Distributor fin type		Perforated	Perforated
Distributor fin height	mm	5.1	5.1
Distributor fin thickness	mm	0.51	0.61
Distributor fin frequency	#/m	236	236
Fin code number for pad 2		2	3
Distributor surface area	m <sup>2</sup>		
% area for heat transfer			

**Outlet Distributors**

		<b>Dist. 1</b>	<b>Dist. 2</b>
Stream number		1	2
Outlet distributor: Type		Full end	Indirect (side)
Outlet header location		Central	Right
Dimension a (axial length)	mm	86.65	58.36
Dimension b	mm	456.48	268.05
Outlet nozzle diameter	mm	254.46	52.48
Number of outlet nozzles/unit		1	1
Header diameter - outlet	mm	566.1	88.36
Fin code number for pad 1		2	3
Distributor fin type		Perforated	Perforated
Distributor fin height	mm	5.1	5.1
Distributor fin thickness	mm	0.51	0.61
Distributor fin frequency	#/m	236	236
Fin code number for pad 2		2	3
Distributor surface area	m <sup>2</sup>		
% area for heat transfer			