STYRENE PARK OFFSITE

Document Title:

Condenser Data Sheet

R0	09-04-2024	IFA	F.sh	M.O	A.M
R0	16-03-2024	IFA	F.sh	M.O	A.M
Rev.	**Issued Date**	**DESCRIPTION**	**PREPARED**	**CHECKED**	**APPROVED**

REVISION RECORD SHEET

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Model no.			Heat exchanged	(kW)	252.
Customer			Surface/Item-Finned tube	(m2)	1579.2
Plant location			Bare tube	(m2)	68.101
Service			MTD, Eff.	(Deg. C)	6.8
Type draft		FORCED	Transfer rate-Finned	(W/m2-K)	26.508
Bay size (WxL)	(m)	2.65 X 6.4	Bare tube, service	(W/m2-K)	614.71
No. of bays/ Items		1	Bare tube, clean	(W/m2-K)	708.13

Basic design data

Pressure design code		ASME VIII div 1	Structural code	UBC 97
Tube bundle code stamped		No.	Flammable service	Yes.
Heating coil code stamped		No.	Lethal/toxic service	No.

Performance Data - Tube Side

					In		Out	
Fluid name		Propane						
Total fluid entering	(kg/hr)	3089.2	Total flow rate (Liq/Vap)	(kg/hr)	0.0000 /	3089.2	3089.2 /	0.0000
Dew/bubble point	(Deg. C)	/	Water/Steam	(kg/hr)	0.0000 /	0.0000	0.0000 /	0.0000
	(Deg. C)		Noncondensables	(kg/hr)		0.0000		0.0000
Latent heat	(kJ/kg)		Molecular Wt. (Vap/Non-cond)		/		/	
Inlet pressure	(bar)	19.867	Density (Liq/Vap)	(kg/m3)	435.50 /	42.251	435.59 /	46.262
Pressure drop (All/Calc)	(bar)	0.200 / 0.016	Specific heat (Liq/Vap)	(kJ/kg-C)	3.6130 /	2.3072	3.6114 /	2.3962
Velocity (Allow/Calc)	(m/s)	/ 0.83	Thermal cond. (Liq/Vap)	(W/m-C)	0.0763 /	0.0248	0.0763 /	0.0239
Inside fouling resistance (m2-K/W)		0.000170	Viscosity (Liq/Vap)	(cP)	0.0728 /	0.0105	0.0729 /	0.0103
		In / Out						
Temperature	(Deg. C)	67.94 / 56.66						

Performance Data - Air Side

Air inlet temperature	(Deg. C)	48.00	Face velocity	(m/s) 3.25
Air flow rate/item	(m3/s)	46.975	Minimum design ambient temp	(Deg. C) 5.00
Mass velocity	(kg/s-m2)		Altitude	(m) 20.000
Air outlet temperature	(Deg. C)	52.06	Static pressure	(Pa) 108.40
Air flow rate/fan	(m3/s)	27.733		

Design, Material, and Construction

Design pressure	(barG)	22 + F.V	**Heating Coil**		NO.
Test pressure	(barG)		No. of tubes		
Design temperature	(Deg. C)	120.00	Tube outside diameter	(mm)	
Min. design metal temp.	(Deg. C)		Tube material		
Tube bundle			Fin material and type		
Size (WxL)	(m)	2.5 X 6.4	Fin thickness	(mm)	
No./Bay		1	ASME Code, Sec. VIII, Div. 1		
Number of tube rows		4	Heating fluid		
Bundles in parallel		1	Heating fluid flow rate	(kg/hr)	
Bundles in series			Temperature (In/Out)	(Deg. C)	/
Structure mounting		Grade	Inlet pressure	(bar)	
Pipe rack beams			Pressure drop (All/Calc)	(kPa)	/
Ladders, walkways, platforms			Design temperature	(Deg. C)	
Structure surface prep.			Design pressure	(bar)	
Header surface prep.			Inlet/Outlet nozzle		/
Louver		NO.	**Header**		
Material			Type		Plug
Action control			Material		SA-516 Gr70(N)
Action type			Corrosion Allowance	(mm)	3
			No. of passes		4
			Tube / Tubesheet		Strength weld

Design, Material, and Construction (continued)

Header (continued)					
Slope / Split	1% on last pass / No				
Plug material	SA 350 LF2 CL.1				
Gasket material	Soft Iron				
Nozzle	No.	Size, (in)	Rating/Facing		
Inlet	1	4	#300		
Outlet	1	2	#300		
Vent					
Drain					
Chemical Cleaning					
Min. Wall Thk.					
Tube					
Material	SA-334 6				
Tube outside diameter	(mm)	25.400			
Min wall thickness	(mm)	1.651			

No./Bundle		140	
Length	(m)	6.096	
Pitch	(mm)	69.850	
Layout		Triangular	
Fin			
Type		Extruded	
Material		Aluminum	
Thickness (Base / Tip)	(mm)	1 / 0.24	
Selection temp.	(C)		
Outside diameter	(mm)	57.150	
Fin density	(fin/meter)	433.1	
ASME Code, Sec. VIII, Div. 1			
Customer Specifications			

Mechanical Equipment

Fan		
Manufacturer	Axial Fans Int Srl (or equivalent)	
No./Bay	2	
RPM	(Revs/min.) 404	
Diameter	(ft) 7	
No. of blades		
Angle	(degrees)	
Pitch adjustment	100% Manual	
Blade material	Aluminium	
Hub material	Manufacturer Standard	
@design temp	(kW)	
@min. ambient temp		
Tip speed		
Driver		
Type	Electrical	
Manufacturer	OME ELECTRIC OR AVL	
No./Bay		
Driver	(kW) 7.5	

RPM		1500	
Service factor			
Enclosure		Exec / IP55	
Voltage		400	
Phase		3	
Cycle		50	
Fan noise level	(dB)	max 85	
Speed Reducer			
Type		V- belt	
Manufacturer			
No./Bay		2	
Service factor			
Speed ratio			
Support			
Vib. switch		YES	
Enclosure			

Controls - Air Side

Air recirculation		Louvers	
Degree control of outlet process temp.		Positioner	
(Max. Cooling),+/-	/	Signal air pressure (bar)	
Action on control signal failure		From	To
Fan pitch		From	To
Louvers		Supply air pressure (bar)	
Actuator air supply		From	To
Fan		From	To

Shipping

Plot area (WxL)	(m)	2.65 X 6.4	Total weight, Dry / Wet	(Kg) (Based On HTRI)	11,800 / 12,300
Bundle weight	(kg)		Shipping	(kg)	
Bay	(kg)				

1) STD. nominated power.