

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض							 	
	احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک								
	MECHANICAL DATA SHEETS FOR 1st STAGE GAS AIR COOLERS								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	پروژه BK	بسته کاری GCS	صادر کننده PEDCO	تهیلات 120	رشته ME	نوع مدرک DT	سریال 0003	نسخه D01	شماره صفحه: ۱ از ۵

طرح نگهداشت و افزایش تولید ۲۷ مخزن

MECHANICAL DATA SHEETS FOR 1st STAGE GAS AIR COOLERS

نگهداشت و افزایش تولید میدان نفتی بینک

D01	JUN. 2022	IFA	H.Adineh	M.Fakharian	M.Mehrshad	
D00	DEC.2021	IFC	H.Adineh	M.Fakharian	M.Mehrshad	
Rev.	Date	Purpose of Issue / Status	Prepared by:	Checked by:	Approved by:	CLIENT Approval

Class: 2 CLIENT Doc. Number: F0Z-708834

status:

IDC: Inter-Discipline Check

IFC: Issued For Comment

IFA: Issued For Approval

AFD: Approved For Design

AFC: Approved For Construction



AFP: Approved For Purchase

AFQ: Approved For Quotation



IFI: Issued For Information

AB-R: As-Built for CLIENT Review



AB-A: As-Built –Approved

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض								
	احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک								
	MECHANICAL DATA SHEETS FOR 1st STAGE GAS AIR COOLERS								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	پروژه BK	بسته کاری GCS	صادر کننده PEDCO	تسهیلات 120	رشته ME	نوع مدرک DT	سریال 0003	نسخه D01	شماره صفحه: ۲ از ۵

REVISION RECORD SHEET												
Page	D00	D01	D02	D03	D04	Page	D00	D01	D02	D03	D04	
1	X	X				65						
2	X	X				66						
3	X	X				67						
4	X	X				68						
5	X	X				69						
6						70						
7						71						
8						72						
9						73						
10						74						
11						75						
12						76						
13						77						
14						78						
15						79						
16						80						
17						81						
18						82						
19						83						
20						84						
21						85						
22						86						
23						87						
24						88						
25						89						
26						90						
27						91						
28						92						
29						93						
30						94						
31						95						
32						96						
33						97						
34						98						
35						99						
36						100						
37						101						
38						102						
39						103						
40						104						
41						105						
42						106						
43						107						
44						108						
45						109						
46						110						
47						111						
48						112						
49						113						
50						114						
51						115						
52						116						
53						117						
54						118						
55						119						
56						120						
57						121						
58						122						
59						123						
60						124						
61						125						
62						126						
63						127						
64						128						

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک							
	MECHANICAL DATA SHEETS FOR 1st STAGE GAS AIR COOLERS							
شماره پیمان:	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
۰۵۳ - ۰۷۳ - ۹۱۸۴	BK	GCS	PEDCO	120	ME	DT	0003	D01

General Notes	
<p>1. The Asterisk * denotes information and/or confirmation required from VENDOR.</p> <p>2. VENDOR shall give tube count of each pass if irregular.</p> <p>3. Inlet/Outlet nozzles' size and number shall be defined by VENDOR at the same side of aircooler (even pass numbers are allowed).</p> <p>4. I/P converter & pneumatic actuator for fan blades shall be provided by VENDOR as per P&ID.</p> <p>5. Hydro Test shall be done for Tube-Side by VENDOR. The test procedure shall comply with the code & spec. requirements.</p> <p>6. 10 % over design on duty / flow rate shall be considered.</p> <p>7. Half of fans shall be equipped with variable pitch automatic system to control fluid outlet temperature.</p> <p>8. Electrical motor shall be rated according to project site condition.</p> <p>9. For LV induction motor the relevant electrical data sheet shall be filled in and submitted by Vendor acc. to IPS-M-EL-131(2) and "Data Sheets For LV Induction Motors" Doc. No. BK-GCS-PEDCO-120-EL-DT-0008.</p> <p>10. Ground and bonding facilities shall be provided by Vendor (at least 2 points) on air coolers' structure.</p> <p>11. Instrument selection, connection & cabling shall be acc. to "Specification For Instrumentation" Doc. No. BK-GNRAL-PEDCO-000-IN-SP-0001 "Specification For Instrument and Control of Package Unit System (PU)" Doc. No. BK-GNRAL-PEDCO-000-IN-SP-0004 "Specification For Instrument/F&G Cables" Doc. No. BK-GNRAL-PEDCO-000-IN-SP-0010 instrumentation design criteria for unit 120</p> <p>12. Surface preparation & coating shall be acc. to "Specification for Painting" with Doc. No. BK-GNRAL-PEDCO-000-PI-SP-0006</p> <p>13. Allowable nozzle load shall be acc. to "Specification For Air Cooled Heat Exchangers" Doc. No. BK-GCS-PEDCO-120-ME-SP-0001</p> <p>14. Vendor shall be responsible for mechanical, process and thermal performance of the equipment</p> <p>15. Bundle to be self draining. The last row should 1% sloped.</p> <p>16. For maximum, minimum and average temperature, also relative humidity refer to "BK-GNRAL-PEDCO-000-PR-DB-0001".</p> <p>17. Material requirement should be in compliance with NACE MR 0175/ISO 15156 and Technical Specification for Material Requirements in Sour service Doc. No. BK-GNRAL-PEDCO-000-PI-SP-0008</p> <p>18. Pipe flanges and flanged fittings shall be according to ANSI B16.5, large diameter steel flange shall be according to ANSI B16.47 series A</p>	
<p>Flange Material Flange material shall be SA 182 Gr 316L</p>	<p>Pipe Material Pipe material shall be SA 312 Gr 316L</p>
<p>19. Hazardous classification, all instrumentation and electrical devices shall be suitable for; TC:T3, GR:IIIB, zone:2</p> <p>20. Air Cooler shall also be checked for Winter Case.</p> <p>21. The prepared data sheets are for one train.</p> <p>22. Gasket shall be spiral wound type, graphite filled with inner ring S.S.316 and outer ring S.S 316.</p> <p>23. All external bolts and nuts shall be hot dip galvanized.</p>	
<p>24. Minimum requirement for pre-commissioning, commissioning, start up and two years operation and spare parts shall be in accordance with document E&C-QC-SP-1.</p>	

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض						 		
	احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک MECHANICAL DATA SHEETS FOR 1st STAGE GAS AIR COOLERS								
شماره پیمان:	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	شماره صفحه: ۴ از ۵
۰۵۳ - ۰۷۳ - ۹۱۸۴	BK	GCS	PEDCO	120	ME	DT	0003	D01	

Mechanical Data Sheets For 1st Stage Gas Air Coolers (AE-2101 A/B/C) / sheet 1 of 2											
Rev	DATA SHEET								Rev		
D01	Plant location	Bushehr (Binak)			Heat exchanged, (Normal x Overdesign) kW			332 x 1.1 (Note 6)		D01	
	CLIENT	NISOC			Surfacec /item-Finned tube, m2			*			
	Tag No.	AE-2101 A/B/C			Bare tube, m2			*			
	No. Req'd	Total	3	Working	2	Standby	1	MTD, eff., °C			
	Service	Sour Service			Transfer rate-finned, W/m2.K			*			
	Type of draught	● Induced ○ Forced			Bare tube, service, W/m2.K			*			
	Bay size (W x L) , m	*			Bare tube, clean, W/m2			*			
	No. of bays/items	*									
	Basic Design Data										
	Code Requirements	API 661 / ASME Code, Sec. VIII, Div. 1			Structural code						
Local Standard	IPS-E-PR-785 / IPS-G-ME-245			Flammable service			● Yes ○ No				
Tube bundle code stamped	○ Yes ● No			Lethal/Toxic service			○ Yes ● No				
Heating coil code stamped	○ Yes ● No			Sour service			○ Yes ● No				
Winterization control	○ Yes ● No			Cyclic service			○ Yes ● No				
Chemical cleaning	○ Yes ● No			Mechanical cleaning			○ Yes ● No				
Performance Data – Tube Side											
D01	Fluid name	Hydrocarbon			Line (Pipe) size, in			In 6 Out 6		D01	
	Total fluid entering, kg/s	2.4067			Temperature, °C			124.80 60			
	Dew/bubble point, °C	/			Total flow rate (liq./vap.), kg/s			- / 2.4067 - / 2.4067			
	○ Pour point ○ Freeze point, °C				Water/Steam, kg/s			- -			
	Latent heat, KJ/Kg				Noncondensable, kg/s			- -			
	Inlet pressure, Barg				Molecular Wt.(cond./vap.)			- / 24.52 - / 24.52			
	Pressure drop (allow./calc.), Bar	0.7 / *			Density (liq./vap.), kg/m3			- / 15.38 - / 18.28			
	Velocity (allow./calc.), m/s	/ *			Specific heat (liq./vap.), KJ/kg.mol.C			- / 54.53 - / 50.54			
	Inside foul res., m2.K/W	0.0002			Thermal conductivity (liq./vap.), W/m.K			- / 0.042 - / 0.033			
					Viscosity (liq./vap.), cP			- / 0.015 - / 0.013			
Performance Data – Air Side											
D01	Air inlet temperature, °C	50.26			Face velocity, m/s			*		D01	
	Air flow rate/item, (m3/s)	*			Min. ambient air temp., °C			5			
	Mass velocity (net free area), kg/s.m2				Altitude, m			12.5			
	Air outlet temperature, °C	*			Static pressure, Bar			*			
	Air flowrate/fan, m3/s	*			Airside foul res., m2.K/W			0.00035			
Design, Materials & Construction											
D01	Design pressure, Barg	22			Heating Coil			○ Yes ● No			
	Test pressure, Barg	Per Code & Spec. Requirements			No. of tubes			O.D., mm			
	Vacume pressure	-			Tube material						
	Design temperature, °C	155			Fin material and type						
	Min. design metal temperature, °C	-28			Thickness, mm						
	NACE Requirement	● Yes ○ No			Pressure design code			ASME Code, Sec. VIII, Div. 1			
	HIC / SSC Test Requirements	○ Yes ● No			Stamp			○ Yes ● No			
	Tube bundle				Heating fluid			Flowrate, kg/s			
	Size (W x L), m	(*)			Temperature (in/out), °C			/			
	No./bay	*			Inlet pressure, Bar						
	Bundles in parallel	In series			Pressure drop (allow./calc.), Bar			/			
	Structure mounting	● Grade ○ Pipe rack ○ Other			Design temp., °C						
	Structural material	SA 36 H.D.G			Design Press., Bar						
	Pipe-rack beams (distance C-C)				Inlet/Outlet nozzle, DN			/			
	Ladders, walkways, platforms	● Yes ○ No			Header						
	Ladders, walkways, platforms material	SA 36 H.D.G			Type			Plug			
	Structure surf. Prep./coating				Material			SA 240 Gr 316L			
	Header surf. Prep./coating				Corr. Allow., mm			-			
	Tube / Tubesheet Connection	Expanded + Strength welded			No. of passes			(Note 2)			
	Bundle Frame	H.D.G.			Radiography			Full (100% RT)			
Vibration Switches	Yes (Explosion Proof, 24 VDC, IP 65)			Post Weld Heat Treatment			-				
Steam Coil	○ Yes ● No										
Recirculation System	○ Yes ● No										
Louver											
Material	SA 283 (H.D.G)										
Action type:	○ Opposed ○ Parallel										
Action control:	○ Auto ● Manual										



نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض

احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک

MECHANICAL DATA SHEETS FOR 1st STAGE GAS AIR COOLERS



شماره پیمان:

۰۵۳ - ۰۷۳ - ۹۱۸۴

پروژه

BK

بسته کاری

GCS

صادر کننده

PEDCO

تسهیلات

120

رشته

ME

نوع مدرک

DT

سریال

0003

نسخه

D01

شماره صفحه: ۵ از ۵

Mechanical Data Sheets For 1st Stage Gas Air Coolers (AE-2101 A/B/C) / sheet 2 of 2

Rev.	DATA SHEET										Rev.				
D01	Header (continued)					No./bundle					Length, (m)				
	Slope, mm/m					Pitch, (mm)					Layout				
	Plug material					Fin					Type				
	Gasket material					Material					Stock thickness, (mm)				
	Nozzle					Selection temperature, °C					O.D. (mm)				
	Inlet					Fin Density (fin / meter)					Design Code				
	Outlet					Customer Specification					ASME Code, Sec. VIII, Div. 1				
	Vent					P&ID Number					BK-GCS-PEDCO-120-PR-PI-0008				
	Drain														
	Misc. Conn's TI														
Min. wall thickness (mm)															
Tube															
Material															
O. D., (mm)															
Min. wall thickness, (mm)															
Mechanical Equipment															
Fan															
Manufacturer & model															
No./Bay															
Speed, r/min															
Diameter, m															
No. of blades															
Angle, Degrees															
Pitch adjustment: <input type="radio"/> Manual <input checked="" type="radio"/> Auto															
Blade material															
Hub material															
kW/fan. @ des. temp. @ min. amb. temp.															
Max. allow. / calc. tip speed, m/s															
Driver															
Type															
Manufacturer, model & Installation type															
No./bay															
Driver kW															
Speed, r/min															
Service factor															
Controls - Air Side															
Air recirculation: <input type="radio"/> None <input type="radio"/> Internal <input type="radio"/> External															
Over: <input type="radio"/> Slide <input type="radio"/> End															
Degree control of outlet process temp. (max. cooling), +/- °C															
Action on control signal failure															
Fan pitch: <input type="radio"/> Minimum <input type="radio"/> Maximum <input type="radio"/> Lockup															
Louvers: <input type="radio"/> Open <input type="radio"/> Close <input type="radio"/> Lockup															
Actuator air supply															
Fan: <input type="radio"/> None <input type="radio"/> Positioner <input type="radio"/> Bias relay															
Shipping															
Plot area (W x L), m															
Bundle mass, kg															
Bay, kg															
Winter Case															
Fluid name															
Temperature, °C															
Total fluid entering, kg/s															
Total flow rate (liq./vap.), kg/s															
Dew/bubble point, °C															
Water/Steam, kg/s															
Noncondensable, kg/s															
Molecular Wt.(cond./vap.)															
Density (liq./vap.), kg/m3															
Specific heat (liq./vap.), KJ/kg.mol.C															
Thermal conductivity (liq./vap.), W/m.K															
Viscosity (liq./vap.), cP															
Latent heat, KJ/Kg															
Inlet pressure, Barg															
Pressure drop (allow./calc.), Bar															
Velocity (allow./calc.), m/s															
Inside foul res., m2.K/W															