

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض						 		
	احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک MECHANICAL DATA SHEETS FOR 2nd 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 0005	نسخه D01	شماره صفحه: ۱ از ۵

طرح نگهداشت و افزایش تولید ۲۷ مخزن

MECHANICAL DATA SHEETS FOR 2nd 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-708836

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 2nd STAGE GAS AIR COOLERS



شماره صفحه: ۲ از ۵



شماره پیمان:

۰۵۳ - ۰۷۳ - ۹۱۸۴

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادر کننده	بسته کاری	پروژه
D01	0005	DT	ME	120	PEDCO	GCS	BK

REVISION RECORD SHEET

Page	D00	D01	D02	D03	D04	Page	D00	D01	D02	D03	D04
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3	X	X				67					
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شماره پیمان:	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
۰۵۳ - ۰۷۳ - ۹۱۸۴	BK	GCS	PEDCO	120	ME	DT	0005	D01

General Notes

- The Asterisk * denotes information and/or confirmation required from VENDOR.
- VENDOR shall give tube count of each pass if irregular.
- Inlet/Outlet nozzles' size and number shall be defined by VENDOR at the same side of aircooler (even pass numbers are allowed).
- I/P converter & pneumatic actuator for fan blades shall be provided by VENDOR as per P&ID.
- Hydro Test shall be done for Tube-Side by VENDOR. The test procedure shall comply with the code & spec. requirements.
- 10 % over design on duty / flow rate shall be considered.
- Half of fans shall be equipped with variable pitch automatic system to control fluid outlet temperature.
- Electrical motor shall be rated according to project site condition.
- 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.
- Ground and bonding facilities shall be provided by Vendor (at least 2 points) on air coolers' structure.
- Instrument selection, connection & cabling shall be acc. to "Specification For Instrumentation" Doc. No. BK-GNRL-PEDCO-000-IN-SP-0001
 "Specification For Instrument and Control of Package Unit System (PU)" Doc. No. BK-GNRL-PEDCO-000-IN-SP-0004
 "Specification For Instrument/F&G Cables" Doc. No. BK-GNRL-PEDCO-000-IN-SP-0010
 instrumentation design criteria for unit 120
- Surface preparation & coating shall be acc. to "Specification for Painting" with Doc. No. BK-GNRL-PEDCO-000-PI-SP-0006
- Allowable nozzle load shall be acc. to "Specification For Air Cooled Heat Exchangers" Doc. No. BK-GCS-PEDCO-120-ME-SP-0001
- Vendor shall be responsible for mechanical, process and thermal performance of the equipment
- Bundle to be self draining. The last row should 1% sloped.
- For maximum, minimum and average temperature, also relative humidity refer to "BK-GNRL-PEDCO-000-PR-DB-0001".
- Material requirement should be in compliance with NACE MR 0175/ISO 15156 and Technical Specification for Material Requirements in Sour service Doc. No. BK-GNRL-PEDCO-000-PI-SP-0008
- 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

Flange Material

Flange material shall be SA 182 Gr 316L

Pipe Material

Pipe material shall be SA 312 Gr 316L

- Hazardous classification, all instrumentation and electrical devices shall be suitable for; TC:T3, GR:IIb, zone:2

- Air Cooler shall also be checked for Winter Case.

D01




- The prepared data sheets are for one train.

- Gasket shall be spiral wound type, graphite filled with inner ring S.S.316 and outer ring S.S 316.



- All external bolts and nuts shall be hot dip galvanized.

- 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.

D01

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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	0005	D01	

Mechanical Data Sheets For 2nd Stage Gas Air Coolers (AE-2102 A/B/C) / sheet 1 of 2										
Rev	DATA SHEET								Rev	
D01	Plant location	Bushehr (Binak)			Heat exchanged, (Normal x Overdesign) kW			493 x 1.1 (Note 6)		
	CLIENT	NISOC			Surface/item-Finned tube, m2			*		
	Tag No.	AE-2102 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		
	Total fluid entering, kg/s	2.4067			Temperature, °C			149.5 60		
	Dew/bubble point, °C	/			Total flow rate (liq./vap.), kg/s			- / 2.3962 - / 0.01039		
	○ Pour point ○ Freeze point, °C				Water/Steam, kg/s			- -		
	Latent heat, KJ/Kg				Noncondensable, kg/s			- -		
	Inlet pressure, Barg	54.8			Molecular Wt.(cond./vap.)			- / 24.52 18.05 / 24.56		
	Pressure drop (allow./calc.), Bar	0.7 / *			Density (liq./vap.), kg/m3			- / 42.92 54.82 / 981.9		
	Velocity (allow./calc.), m/s	/ *			Specific heat (liq./vap.), KJ/kg.mol.C			- / 58.79 57.94 / 77.82		
	Inside foul res., m2.K/W	0.0002			Thermal conductivity (liq./vap.), W/m.K			- / 0.047 0.652 / 0.037		
					Viscosity (liq./vap.), cP			- / 0.016 0.494 / 0.014		
Performance Data – Air Side										
D01	Air inlet temperature, °C	50.26			Face velocity, m/s			*		
	Air flow rate/item, (m3/s)	*			Min. ambient air temp., °C			D01 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	*			Airsides foul res., m2.K/W			0.00035		
	Design, Materials & Construction									
	Design pressure, Barg	62			Heating Coil			○ Yes ● No		
	Test pressure, Barg	Per Code & Spec. Requirements			No. of tubes			O.D., mm		
	Vacume pressure	-			Tube material					
	Design temperature, °C	175			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									

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۰۵۳ - ۰۷۳ - ۹۱۸۴	BK	GCS	PEDCO	120	ME	DT	0005	D01
شماره صفحه: ۵ از ۵								

Mechanical Data Sheets For 2nd Stage Gas Air Coolers (AE-2102 A/B/C) / sheet 1 of 2									
Rev.	DATA SHEET								Rev.
D01	Header (continued)				No./bundle				Length, (m)
	Slope, mm/m				Pitch, (mm)				
	Plug material				Layout				
	Gasket material				Fin				
	Nozzle				Type				
	No.	Size, (in)	Rating / Facing		Material				
	Inlet (Note 3)	1	6 *	600# , R.F.	Stock thickness, (mm)				
	Outlet (Note 3)	1	6 *	600# , R.F.	Selection temperature, °C				
	Vent	1	2	600# , R.F.	O.D. (mm)				
	Drain	1	2	600# , R.F.	Fin Density (fin / meter)				
	Misc. Conn's TI	PI			Design Code				
	Min. wall thickness (mm)				ASME Code, Sec. VIII, Div. 1				
	Tube				Customer Specification				
	Material				P&ID Number				
	O. D., (mm)				BK-GCS-PEDCO-120-PR-PI-0011				
Mechanical Equipment									
Fan				Enclosure					
Manufacturer & model				Volt					
No./Bay				Phase					
Speed, r/min				Cycle					
Diameter, m				Fan noise level (allow./calc.), dB(a), @ m					
No. of blades				Fan max. sound pressure level					
Angle, Degrees				Fan Area Classification					
Pitch adjustment: <input type="radio"/> Manual <input checked="" type="radio"/> Auto (Note 4 & 7)				Speed reducer					
Blade material				Type					
kW/ fan. @ des. temp.				Manufacturer & model					
Max. allow. / calc. tip speed, m/s				No./bay					
Driver				Service factor					
Type				Speed ratio					
Manufacturer, model & Installation type				Support:					
No./bay				<input checked="" type="radio"/> Structure <input type="radio"/> Pedestal					
Speed, r/min				<input checked="" type="radio"/> Yes (Excd, IIB, T4) <input type="radio"/> No					
Controls - Air Side									
Air recirculation: <input type="radio"/> None <input type="radio"/> Internal <input type="radio"/> External				Louvers: <input type="radio"/> Inlet <input type="radio"/> Outlet <input type="radio"/> Bypass					
Over: <input type="radio"/> Slide <input type="radio"/> End				Positioner: <input type="radio"/> Yes <input type="radio"/> No					
Degree control of outlet process temp. (max. cooling), +/- °C				Signal air pressure, Barg					
Action on control signal failure				From					
Fan pitch: <input type="radio"/> Minimum <input type="radio"/> Maximum <input type="radio"/> Lockup				From					
Louvers: <input type="radio"/> Open <input type="radio"/> Close <input type="radio"/> Lockup				Supply air pressure, Barg					
Actuator air supply				Max.					
Fan: <input type="radio"/> None <input type="radio"/> Positioner <input type="radio"/> Bias relay				Max.					
Shipping									
Plot area (W x L), m				Total, kg					
Bundle mass, kg				Shipping, 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					
<input type="radio"/> Pour point <input type="radio"/> Freeze point, °C				Noncondensable, kg/s					
Latent heat, KJ/Kg				Molecular Wt.(cond./vap.)					
Inlet pressure, Barg				Density (liq./vap.), kg/m3					
Pressure drop (allow./calc.), Bar				Specific heat (liq./vap.), KJ/kg.mol.C					
Velocity (allow./calc.), m/s				Thermal conductivity (liq./vap.), W/m.K					
Inside foul res., m2.K/W				Viscosity (liq./vap.), cP					