

 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 D02	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

D02	OCT.2022	IFA	H.Adineh	M.Fakharian	M.Mehrshad	
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 صفحه: ۲ از ۵

شماره پیمان:

۰۵۳ - ۰۷۳ - ۹۱۸۴

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادر کننده	بسته کاری	پروژه
D02	0003	DT	ME	120	PEDCO	GCS	BK

REVISION RECORD SHEET

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3	X	X	X			67					
4	X	X	X			68					
5	X	X	X			69					
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 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	D02

General Notes D02	
1. The Asterisk * denotes information and/or confirmation required from VENDOR. 2. VENDOR shall give tube count of each pass if irregular. 3. Inlet/Outlet nozzles' size and number shall be defined by VENDOR at the same side of aircooler (even pass numbers are allowed). 4. I/P converter & pneumatic actuator for fan blades shall be provided by VENDOR as per P&ID. 5. Hydro Test shall be done for Tube-Side by VENDOR. The test procedure shall comply with the code & spec. requirements. 6. 10 % over design on duty / flow rate shall be considered. 7. Half of fans shall be equipped with variable pitch automatic system to control fluid outlet temperature. 8. Electrical motor shall be rated according to project site condition. 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. 10. Ground and bonding facilities shall be provided by Vendor (at least 2 points) on air coolers' structure. 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 12. Surface preparation & coating shall be acc. to "Specification for Painting" with Doc. No. BK-GNRAL-PEDCO-000-PI-SP-0006 13. Allowable nozzle load shall be acc. to "Specification For Air Cooled Heat Exchangers" Doc. No. BK-GCS-PEDCO-120-ME-SP-0001 14. Vendor shall be responsible for mechanical, process and thermal performance of the equipment 15. Bundle to be self draining. The last row should 1% sloped. 16. For maximum, minimum and average temperature, also relative humidity refer to "BK-GNRAL-PEDCO-000-PR-DB-0001". 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, IPS-MPM-200 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 <u>Flange Material</u> Flange material shall be SA 182 Gr 316L <u>Pipe Material</u> Pipe material shall be SA 312 Gr 316L 19. Hazardous classification, all instrumentation and electrical devices shall be acc. To "Hazard Source List" Doc. No. BK-GCS-PEDCO-120-SA-LI-0001 and "Hazardous Area Classification Layout" Doc. No. BK-GCS-PEDCO-120_SA-PY-0002 20. Air Cooler shall also be checked for Winter Case. 21. The prepared data sheets are for one train. 22. Gasket shall be spiral wound type, graphite filled with inner ring S.S.316 and outer ring S.S 316. 23. All external bolts and nuts shall be hot dip galvanized. 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. 25. It will be finalized after receiving compressor supplier data.	

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض						 شرکت توسعه و پارس		
	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	D02	

Mechanical Data Sheets For 1st Stage Gas Air Coolers (AE-2101 A/B/C) / sheet 1 of 2										
Rev	DATA SHEET								Rev	
D02	Plant location	Bushehr (Binak)			Heat exchanged, (Normal x Overdesign) kW			332 x 1.1 (Note 6)		
	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										
				D02						
Fluid name	Hydrocarbon			Line (Pipe) size, in			In 6 Out 6			
Total fluid entering, kg/h	8664			Temperature, °C			124.8 (Note25) 60			
Dew/bubble point, °C	/			Total flow rate (liq./vap.), kg/h			- / 8664 - / 8664			
○ 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										
Air inlet temperature, °C	50.26			Face velocity, m/s			*			
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	*			Airsides foul res., m2.K/W			0.00035			
Design, Materials & Construction										
				D02						
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 *	No. of tube rows *			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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	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	صادرکننده: PEDCO	تسهیلات: 120	رشته: ME	نوع مدرک: DT	سریال: 0003	نسخه: D02
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.	
	Header (continued) Slope, mm/m _____ Plug material SA 182 Gr. 316L Gasket material _____ Nozzle Inlet (Note 3) No. 1* Size, (in) 6 * Rating / Facing 300# , R.F. Outlet (Note 3) 1* 6 * 300# , R.F. Vent 1 2 300# , R.F. Drain 1 2 300# , R.F. Misc. Conn's TI _____ PI _____ Min. wall thickness (mm) _____ Tube Material SA 213 Gr 316L O. D., (mm) _____ Min. wall thickness, (mm) _____				No./bundle _____ Length, (m) _____ Pitch, (mm) _____ Layout _____ Fin Type _____ Material _____ Stock thickness, (mm) _____ Selection temperature, °C _____ O.D. (mm) _____ Fin Density (fin / meter) _____ Design Code _____ ASME Code, Sec. VIII, Div. 1 Customer Specification _____ P&ID Number _____ BK-GCS-PEDCO-120-PR-PI-0008					
	Mechanical Equipment									
	D02									
	Fan Manufacturer & model _____ No./Bay _____ Speed, r/min _____ Diameter, m _____ No. of blades _____ Angle, Degrees _____ Pitch adjustment: ☐ Manual ☒ Auto (Note 4 & 7) Blade material Aluminum (ASTM B179) Hub material _____ kW/ fan. @ des. temp. _____ @ min. amb. temp. _____ Max. allow. / calc. tip speed, m/s _____ / _____ Driver Type Electric Motor Manufacturer, model & Installation type _____ No./bay _____ Driver kW _____ Speed, r/min _____ Service factor _____				Enclosure _____ Volt 400 Phase 3 Cycle 50 HZ Fan noise level (allow./calc.), dB(a), @ m 75 dB @ 15m Fan max. sound pressure level 85 dBA Fan Area Classification Zone 2, IIB, T3 (Note 19) Speed reducer Type _____ Manufacturer & model _____ No./bay _____ Service factor _____ Speed ratio _____ Support: ☒ Structure ☐ Pedestal Vib. Switch: ☒ Yes (Eexd,IIB,T4) ☐ No Enclosure _____					
	Controls - Air Side									
	Air recirculation: ☐ None ☐ Internal ☐ External Over: ☐ Slide ☐ End Degree control of outlet process temp. (max. cooling), +/- °C _____ / _____ Action on control signal failure _____ Fan pitch: ☐ Minimum ☐ Maximum ☐ Lockup Louvres: ☐ Open ☐ Close ☐ Lockup Actuator air supply _____ Fan: ☐ None ☐ Positioner ☐ Bias relay				Louvres: ☐ Inlet ☐ Outlet ☐ Bypass Positioner: ☐ Yes ☐ No Signal air pressure, Barg _____ From _____ To _____ From _____ To _____ Supply air pressure, Barg _____ Max. _____ Min. _____ Max. _____ Min. _____					
	Shipping									
	Plot area (W x L), m _____ Bundle mass, kg _____ Bay, kg _____				Total , kg _____ Shipping, kg _____					
	Winter Case									
	D02									
D02	Fluid name Hydrocarbon Total fluid entering, kg/h 7585 Dew/bubble point, °C _____ / _____ ☐ Pour point ☐ Freeze point, °C _____ Latent heat, KJ/Kg _____ Inlet pressure, Barg _____ Pressure drop (allow./calc.), Bar 0.7 / * Velocity (allow./calc.), m/s _____ / _____ Inside foul res., m2.K/W 0.0002				Temperature, °C 113.1 60 Total flow rate (liq./vap.), kg/h - / 7585 - / 7585 Water/Steam, kg/s _____ Noncondensable, kg/s _____ Molecular Wt.(cond./vap.) - / 21.56 - / 21.56 Density (liq./vap.),kg/m3 - / 13.85 - / 15.81 Specific heat (liq./vap.),KJ/kg.mol.C - / 48.4 - / 45.63 Thermal conductivity (liq./vap.), W/m.K - / 0.042 - / 0.035 Viscosity (liq./vap.), cP - / 0.014 - / 0.013				D02	