

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک						 شرکت توسعه و پترو ایران 		
	MECHANICAL DATA SHEETS FOR 2nd STAGE GAS AIR COOLERS								
شماره پیمان:	پروژه	بسته کاری	صادر کننده	تهیلات	رشته	نوع مدرک	سریال	نسخه	شماره صفحه: ۱ از ۵
۰۵۳ - ۰۷۳ - ۹۱۸۴	BK	GCS	PEDCO	120	ME	DT	0005	D02	

طرح نگهداشت و افزایش تولید ۲۷ مخزن

MECHANICAL DATA SHEETS FOR 2nd 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	
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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
D02	0005	DT	ME	120	PEDCO	GCS	BK

REVISION RECORD SHEET

Page	D00	D01	D02	D03	D04	Page	D00	D01	D02	D03	D04
1	X	X	X			65					
2	X	X	X			66					
3	X	X	X			67					
4	X	X	X			68					
5	X	X	X			69					
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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 2nd STAGE GAS AIR COOLERS							
شماره پیمان:	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدبرک	سریال	نسخه
۰۵۳ - ۰۷۳ - ۹۱۸۴	BK	GCS	PEDCO	120	ME	DT	0005	D02

General Notes	
	D02
- 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-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 - Surface preparation & coating shall be acc. to "Specification for Painting" with Doc. No. BK-GNRAL-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-GNRAL-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-GNRAL-PEDCO-000-PI-SP-0008, IPS-MPM-200 - 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 - 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 - Air Cooler shall also be checked for Winter Case. - 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. - It will be finalized after receiving compressor supplier data.	

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	احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک MECHANICAL DATA SHEETS FOR 2nd 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	0005	D02	

Mechanical Data Sheets For 2nd Stage Gas Air Coolers (AE-2102 A/B/C) / sheet 1 of 2									
Rev	DATA SHEET								Rev
	Plant location <u>Bushehr (Binak)</u> CLIENT <u>NISOC</u> Tag No. <u>AE-2102 A/B/C</u> No. Req'd Total <u>3</u> Working <u>2</u> Standby <u>1</u> Service <u>Sour Service</u> Type of draught ☒ Induced ☐ Forced Bay size (W x L) , m <u>*</u> No. of bays/items <u>*</u>				Heat exchanged, (Normal x Overdesign) kW <u>493 x 1.1 (Note 6)</u> Surface/item-Finned tube, m2 <u>*</u> Bare tube, m2 <u>*</u> MTD, eff., °C <u>*</u> Transfer rate-finned, W/m2.K <u>*</u> Bare tube, service, W/m2.K <u>*</u> Bare tube, clean, W/m2 <u>*</u>				
Basic Design Data									
Code Requirements <u>API 661 / ASME Code, Sec. VIII, Div. 1</u> Local Standard <u>IPS-E-PR-785 / IPS-G-ME-245</u> Tube bundle code stamped ☐ Yes ☒ No Heating coil code stamped ☐ Yes ☒ No Winterization control ☐ Yes ☒ No Chemical cleaning ☐ Yes ☒ No				Structural code <u></u> Flammable service ☒ Yes ☐ No Lethal/Toxic service ☐ Yes ☒ No Sour service ☐ Yes ☒ No Cyclic service ☐ Yes ☒ No Mechanical cleaning ☐ Yes ☒ No					
Performance Data – Tube Side D02									
	Fluid name <u>Hydrocarbon</u> Total fluid entering, kg/h <u>8664.0</u> Dew/bubble point, °C <u>/</u> ☐ Pour point ☐ Freeze point, °C Latent heat, KJ/Kg <u>54.8</u> Inlet pressure, Barg <u>0.7 / *</u> Pressure drop (allow./calc.), Bar <u>/ *</u> Velocity (allow./calc.), m/s <u>/ *</u> Inside foul res., m2.K/W <u>0.0002</u>				Line (Pipe) size, in <u>6</u> Temperature, °C <u>142.3 (Note 25)</u> Total flow rate (liq./vap.), kg/h <u>- / 8626.3</u> <u>- / 37.4</u> Water/Steam, kg/s <u>-</u> Noncondensable, kg/s <u>-</u> Molecular Wt.(cond./vap.) <u>- / 24.52</u> <u>18.05 / 24.56</u> Density (liq./vap.), kg/m3 <u>- / 42.92</u> <u>981.9 / 59.39</u> Specific heat (liq./vap.), KJ/kg.mol.C <u>- / 59.25</u> <u>77.81 / 58.95</u> Thermal conductivity (liq./vap.), W/m.K <u>- / 0.047</u> <u>0.652 / 0.037</u> Viscosity (liq./vap.), cP <u>- / 0.016</u> <u>0.494 / 0.014</u>				
	Air inlet temperature, °C <u>50.26</u> Air flow rate/item, (m3/s) <u>*</u> Mass velocity (net free area), kg/s.m2 <u>*</u> Air outlet temperature, °C <u>*</u> Air flowrate/fan, m3/s <u>*</u>				Face velocity, m/s <u>*</u> Min. ambient air temp., °C <u>5</u> Altitude, m <u>12.5</u> Static pressure, Bar <u>*</u> Airside foul res., m2.K/W <u>0.00035</u>				
Design, Materials & Construction D02									
Design pressure, Barg <u>62</u> Test pressure, Barg <u>Per Code & Spec. Requirements</u> Vacume pressure <u>-</u> Design temperature, °C <u>175</u> Min. design metal temperature, °C <u>-28</u> NACE Requirement ☒ Yes ☐ No HIC / SSC Test Requirements ☐ Yes ☒ No Tube bundle Size (W x L), m <u>*</u> No./bay <u>*</u> No. of tube rows <u>*</u> Bundles in parallel <u>*</u> Structure mounting ☒ Grade ☐ In series ☐ Pipe rack ☐ Other Structural material <u>SA 36 H.D.G</u> Pipe-rack beams (distance C-C) <u></u> Ladders, walkways, platforms ☒ Yes ☐ No Ladders, walkways, platforms material <u>SA 36 H.D.G</u> Structure surf. Prep./coating <u></u> Header surf. Prep./coating <u></u> Tube / Tubesheet Connection <u>Expanded + Strength welded</u> Bundle Frame <u>H.D.G.</u> Vibration Switches <u>Yes (Explosion Proof, 24 VDC, IP 65)</u> Steam Coil ☐ Yes ☒ No Recirculation System ☐ Yes ☒ No Louver Material <u>SA 283 (H.D.G)</u> Action type: ☐ Opposed ☐ Parallel Action control: ☐ Auto ☒ Manual				Heating Coil ☐ Yes ☒ No No. of tubes <u>O.D., mm</u> Tube material <u></u> Fin material and type <u></u> Thickness, mm <u></u> Pressure design code <u>ASME Code, Sec. VIII, Div. 1</u> Stamp ☐ Yes ☒ No Heating fluid <u></u> Temperature (in/out), °C <u>/</u> Inlet pressure, Bar <u>/</u> Pressure drop (allow./calc.), Bar <u>/</u> Design temp, °C <u></u> Design Press., Bar <u></u> Inlet/Outlet nozzle, DN <u>/</u> Header Type <u>Plug (*)</u> Material <u>SA 240 Gr 316L</u> Corr. Allow., mm <u>-</u> No. of passes <u>(Note 2)</u> Radiography <u>Full (100% RT)</u> Post Weld Heat Treatment <u>-</u>					

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	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	تسهیلات 120	رشته ME	نوع مدرک DT	سریال 0005	نسخه D02
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.
	Header (continued) Slope, mm/m _____ Plug material _____ Gasket material _____ Nozzle Inlet (Note 3) No. 1 Size, (in) 6 * Rating / Facing 600# , R.F. Outlet (Note 3) 1 6 * 600# , R.F. Vent 1 2 600# , R.F. Drain 1 2 600# , 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-0011				
Mechanical Equipment									
	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 _____				D02
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	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 54.8 Pressure drop (allow./calc.), Bar 0.7 / * Velocity (allow./calc.), m/s / * Inside foul res., m2.K/W 0.0002				Temperature, °C 149.5 (Note25) 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 - / 36.11 - / 49.41 Specific heat (liq./vap.),KJ/kg.mol.C - / 53.12 - / 51.31 Thermal conductivity (liq./vap.), W/m.K - / 0.05 - / 0.039 Viscosity (liq./vap.), cP - / 0.016 - / 0.014				D02