

 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 D03	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

D03	JAN.2023	IFA	H.Adineh	M.Fakharian	M.Mehrshad	
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: 1

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
D03	0003	DT	ME	120	PEDCO	GCS	BK

REVISION RECORD SHEET

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2	X	X	X	X		66					
3	X	X	X	X		67					
4	X	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	D03

General Notes D03	
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 based on ITP. The test procedure shall comply with the code & spec. requirements and it should be confirmed by CLIENT. 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.	
26. vendor is responsible to provide vibration switch (10A@110VAC rating)suitable for 24 VDC Signal. The switches shall be EExd, IIB T4 and the weatherproof requirements of IP-65 as per IEC-60529. •Switch element shall be of the micro switch snap action type Micro-switches shall be two double pole double throw (DPDT) type •Repeatability shall be ±1% or better of full scale •The accuracy of the pressure switch assembly shall be at least 1% of the span	

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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	0003	D03	

Mechanical Data Sheets For 1st Stage Gas Air Coolers (AE-2101 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-2101 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>332 x 1.1 (Note 6)</u> Surfacec /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									
Fluid name <u>Hydrocarbon</u> Total fluid entering, kg/h <u>8664</u> Dew/bubble point, °C <u>/</u> ☐ Pour point ☐ Freeze point, °C <u></u> Latent heat, KJ/Kg <u></u> Inlet pressure, Barg <u>19</u> Pressure drop (allow./calc.), Bar <u>0.7 / *</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>124.8 (Note25)</u> Total flow rate (liq./vap.), kg/h <u>- / 8664</u> Water/Steam, kg/s <u>-</u> Noncondensable, kg/s <u>-</u> Molecular Wt.(cond./vap.) <u>- / 24.52</u> Density (liq./vap.), kg/m3 <u>- / 15.38</u> Specific heat (liq./vap.), KJ/kg.mol.C <u>- / 54.53</u> Thermal conductivity (liq./vap.), W/m.K <u>- / 0.042</u> Viscosity (liq./vap.), cP <u>- / 0.015</u>					
Performance Data – Air Side									
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									
Design pressure, Barg <u>22</u> Test pressure, Barg <u>Per Code & Spec. Requirements</u> Vacume pressure <u>-</u> Design temperature, °C <u>155</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> In series <u></u> Structure mounting ☒ Grade ☐ 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>				Heating Coil ☐ Yes ☒ No No. of tubes <u></u> O.D., mm <u></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> Flowrate, kg/s <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>					
D03	Vibration Switches <u>Yes (Explosion Proof, 24 VDC, IP 65)</u> <u>(Note 26)</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								



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: ۵ از ۵

شماره پیمان:

۰۵۳ - ۰۷۳ - ۹۱۸۴

پروژه

BK

بسته کاری

GCS

صادرکننده

PEDCO

تجهیزات

120

رشته

ME

نوع مدرک

DT

سریال

0003

نسخه

D03

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 <u>SA 182 Gr. 316L</u> Gasket material _____ Nozzle Inlet <u>(Note 3)</u> No. <u>1*</u> Size, (in) <u>6 *</u> Rating / Facing <u>300# , R.F.</u> Outlet <u>(Note 3)</u> <u>1*</u> <u>6 *</u> <u>300# , R.F.</u> Vent <u>1</u> <u>2</u> <u>300# , R.F.</u> Drain <u>1</u> <u>2</u> <u>300# , R.F.</u> Misc. Conn's TI _____ PI _____ Min. wall thickness (mm) _____ Tube Material <u>SA 213 Gr 316L</u> O. D., (mm) _____ Min. wall thickness, (mm) _____											No./bundle _____ Pitch, (mm) _____ Layout _____ Fin Type _____ Material _____ Stock thickness, (mm) _____ Selection temperature, °C _____ O.D. (mm) _____ Fin Density (fin / meter) _____ Design Code _____ Customer Specification _____ P&ID Number _____	Length, (m) _____ ASME Code, Sec. VIII, Div. 1 _____ BK-GCS-PEDCO-120-PR-PI-0008
Mechanical Equipment Fan Manufacturer & model _____ No./Bay _____ Speed, r/min _____ Diameter, m _____ No. of blades _____ Angle, Degrees _____ Pitch adjustment: ☐ Manual ☒ Auto <u>(Note 4 & 7)</u> Blade material <u>Aluminum (ASTM B179)</u> Hub material _____ kW/ fan. @ des. temp. _____ @ min. amb. temp. _____ Max. allow. / calc. tip speed, m/s _____ Driver Type <u>Electric Motor</u> Manufacturer, model & Installation type _____ No./bay _____ Driver kW _____ Speed, r/min _____ Service factor _____											Enclosure _____ Volt <u>400</u> Phase <u>3</u> Cycle <u>50 HZ</u> Fan noise level (allow./calc.), dB(a), @ m <u>75 dB @ 15m</u> Fan max. sound pressure level <u>85 dBA</u> Fan Area Classification <u>Zone 2, IIB, T3 (Note 19)</u> 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 Fluid name <u>Hydrocarbon</u> Total fluid entering, kg/h <u>7585</u> Dew/bubble point, °C _____ ☐ Pour point ☐ Freeze point, °C _____ Latent heat, KJ/Kg _____ Inlet pressure, Barg _____ Pressure drop (allow./calc.), Bar <u>0.7 / *</u> Velocity (allow./calc.), m/s _____ Inside foul res., m2.K/W <u>0.0002</u>											Temperature, °C <u>113.1</u> <u>60</u> Total flow rate (liq./vap.), kg/h <u>- / 7585</u> <u>- / 7585</u> Water/Steam, kg/s _____ Noncondensable, kg/s _____ Molecular Wt.(cond./vap.) <u>- / 21.56</u> <u>- / 21.56</u> Density (liq./vap.),kg/m3 <u>- / 13.85</u> <u>- / 15.81</u> Specific heat (liq./vap.),KJ/kg.mol.C <u>- / 48.4</u> <u>- / 45.63</u> Thermal conductivity (liq./vap.), W/m.K <u>- / 0.042</u> <u>- / 0.035</u> Viscosity (liq./vap.), cP <u>- / 0.014</u> <u>- / 0.013</u>	