

 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	تهیلات	رشته	نوع مدرک	سریال	نسخه	شماره صفحه: ۱ از ۵
۰۵۳ - ۰۷۳ - ۹۱۸۴	BK	GCS	PEDCO	120	ME	DT	0003	D04	

طرح نگهداشت و افزایش تولید ۲۷ مخزن

MECHANICAL DATA SHEETS FOR 1st STAGE GAS AIR COOLERS

نگهداشت و افزایش تولید میدان نفتی بینک

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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: ۵ از ۲

شماره پیمان:

۰۵۳ - ۰۷۳ - ۹۱۸۴

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادر کننده	بسته کاری	پروژه
D04	0003	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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2	X	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	شماره صفحه: ۵ از ۳
۰۵۳ - ۰۷۳ - ۹۱۸۴	BK	GCS	PEDCO	120	ME	DT	0003	D04	

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 based on ITP. The test procedure shall comply with the code & spec. requirements and it should be confirmed by CLIENT.
 - 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
- | | |
|---|---|
| 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 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.
 - 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 $\pm 1\%$ or better of full scale
 - The accuracy of the pressure switch assembly shall be at least 1% of the span

 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	D04	

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></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> Vibration Switches <u>Yes (Explosion Proof, 24 VDC, IP 65) (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				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>					



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

تجهیزات

120

رشته

ME

نوع مدرک

DT

سرنال

0003

نسخه

D04

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)					No./bundle					Length, (m)
	Slope, mm/m					Pitch, (mm)					
	Plug material					Layout					
	Gasket material					Fin					
	Nozzle	No.	Size, (in)	Rating / Facing		Type					
	Inlet (Note 3)	1*	6 *	300#, R.F.		Material					
	Outlet (Note 3)	1*	6 *	300#, R.F.		Stock thickness, (mm)					
	Vent	1	2	300#, R.F.		Selection temperature, °C					
	Drain	1	2	300#, R.F.		O.D. (mm)					
	Misc. Conn's TI				PI	Fin Density (fin / meter)					
	Min. wall thickness (mm)					Design Code					ASME Code, Sec. VIII, Div. 1
	Tube					Customer Specification					
	Material					P&ID Number					BK-GCS-PEDCO-120-PR-PI-0008
	O. D., (mm)					Min. wall thickness, (mm)					
	Mechanical Equipment										
	Fan					Enclosure					
	Manufacturer & model					Volt					Phase
	No./Bay					Speed, r/min					Cycle
	Diameter, m					No. of blades					Fan noise level (allow./calc.), dB(a), @ m
	Angle, Degrees					Pitch adjustment:					75 dB @ 15m
	Blade material					Hub material					85 dBA
	kW/ fan. @ des. temp.					@ min. amb. temp.					Fan max. sound pressure level
	Max. allow. / calc. tip speed, m/s										Fan Area Classification
	Driver					Speed reducer					Zone 2, IIB, T3 (Note 19)
	Type					Type					
	Manufacturer, model & Installation type					Manufacturer & model					
	No./bay					No./bay					
	Speed, r/min					Service factor					Speed ratio
	Service factor					Support:					Structure
						Vib. Switch:					Yes (Eexd, IIB, T4)
						Enclosure					No
	Controls - Air Side										
	Air recirculation:					Louvers:					Inlet
	Over:					Positioner:					Outlet
	Degree control of outlet process temp.					Signal air pressure, Barg					Bypass
	(max. cooling), +/- °C					From					To
	Action on control signal failure					From					To
	Fan pitch:					Supply air pressure, Barg					
	Louvers:					Max.					Min.
	Actuator air supply					Max.					Min.
	Fan:										
	Shipping										
	Plot area (W x L), m					Total, kg					
	Bundle mass, kg					Shipping, kg					
	Bay, kg										
	Winter Case										
	Fluid name					Temperature, °C					113.1
	Total fluid entering, kg/h					Total flow rate (liq./vap.), kg/h					60
	Dew/bubble point, °C					Water/Steam, kg/s					- / 7585
	Pour point					Noncondensable, kg/s					-
	Freeze point, °C					Molecular Wt.(cond./vap.)					- / 21.56
	Latent heat, KJ/Kg					Density (liq./vap.), kg/m3					- / 13.85
	Inlet pressure, Barg					Specific heat (liq./vap.), KJ/kg.mol.C					- / 48.4
	Pressure drop (allow./calc.), Bar					Thermal conductivity (liq./vap.), W/m.K					- / 0.042
	Velocity (allow./calc.), m/s					Viscosity (liq./vap.), cP					- / 0.014
	Inside foul res., m2.K/W										- / 0.013