

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج کولرهای هوایی ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0015_02)						  	
	شماره پیمان: 053 - 073 - 9184						شماره صفحه : 1 از 6	
Process Data Sheet for AE-2102 (A/B/C)								
نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه	
V03	0002	DS	PR	120	AA	GCS	BK	

طرح نگهداشت و افزایش تولید 27 مخزن

Process Data Sheet for AE-2102 (A/B/C)

نگهداشت و افزایش تولید میدان نفتی بینک

V03	Sep.2024	AFC	AAC	M.FAKHARIAN	M.SADEGHIAN	
V02	Aug.2024	IFA	AAC	M.FAKHARIAN	M.SADEGHIAN	
V01	Mar.2024	IFA	AAC	M.FAKHARIAN	S.FRAMARZPOR	
V00	Nov.2023	IFA	AAC	M.FAKHARIAN	S.FRAMARZPOR	
Rev.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	CLIENT Approval

Status:

IFA: Issued For Approval
IFI: Issued For Information
AFC: Approved For Construction

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج کولرهای هوایی ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0015_02)		  					
	Process Data Sheet for AE-2102 (A/B/C)		شماره صفحه : 2 از 6					
شماره پیمان: 053 - 073 - 9184	نسخه V03	سریال 0002	نوع مدرک DS	رشته PR	تسهیلات 120	صادرکننده AA	بسته کاری GCS	پروژه BK

REVISION RECORD SHEET

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 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج کولرهای هوایی ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0015_02)																									
شماره پیمان: 053 – 073 – 9184	<table><tr><th colspan="8">Process Data Sheet for AE-2102 (A/B/C)</th></tr><tr><th>نسخه</th><th>سریال</th><th>نوع مدرک</th><th>رشته</th><th>تسهیلات</th><th>صادرکننده</th><th>بسته کاری</th><th>پروژه</th></tr><tr><td>V03</td><td>0002</td><td>DS</td><td>PR</td><td>120</td><td>AA</td><td>GCS</td><td>BK</td></tr></table>	Process Data Sheet for AE-2102 (A/B/C)								نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه	V03	0002	DS	PR	120	AA	GCS	BK	شماره صفحه : 3 از 6
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نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
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1.0 INTRODUCTION

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 20 km northwest of Genaveh city.

With the aim of increasing production of oil from Binak oilfield, an EPC/EPD Project has been defined by NIOC/NISOC and awarded to Petro Iran Development Company (PEDCO). Also PEDCO (as General Contractor) has assigned the EPC-packages of the Project to "Hirgan Energy - Design and Inspection" JV.

GENERAL DEFINITION

The following terms shall be used in this document.

CLIENT:	National Iranian South Oilfields Company (NISOC)
PROJECT:	Binak Oilfield Development – Manufacturing (w/Engineering & Material Supply) of Air Coolers
EPD/EPC CONTRACTOR (GC):	Petro Iran Development Company (PEDCO)
OWNER:	OWNER is collectively refer to National Iranian South Oil Company (NISOC) and Petro Iran Development Company (PEDCO)
EPC CONTRACTOR:	Joint Venture of : Hirgan Energy – Design & Inspection(D&I) Companies
VENDOR:	Aban Air Cooler (AAC)
EXECUTOR:	Executor is the party which carries out all or part of construction and/or commissioning for the project.
THIRD PARTY INSPECTOR (TPI):	Third Party Inspector
SHALL:	Is used where a provision is mandatory.
SHOULD:	Is used where a provision is advisory only.
WILL:	Is normally used in connection with the action by CLIENT rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR.
MAY:	Is used where a provision is completely discretionary.

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج کولرهای هوایی ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0015_02)	
شماره پیمان: 053-073-9184	Process Data Sheet for AE-2102 (A/B/C)	شماره صفحه: 5 از 6
پروژه بسته کاری صادرکننده تسهیلات رشته نوع مدرک سریال نسخه	BK GCS AA 120 PR DS 0002 V03	

2.0 PROCESS DATA SHEET FOR AE-2102 (A/B/C)

rev.	AAC		DATA SHEET		Date : 2024.Sep.30	
	AIR COOLED HEAT EXCHANGER		ABAN AIR COOLER CO		Rev : 3	
	(PEDCO) / (NISOC)				CASE: 00012-AC-3991	
	Binak oilfield				Item no.: AE-2102 (A/B/C)	
	2st Stage Gas Compression Cooler				Summer Case	
	2.12 x 3.90 (note2)				No. Units: 3	
	Plot size(W,L) [m]		DRAFT INDUCED		No. of bay: 1	
3	Surface / unit-Finned 1010.5 [m2]		Bare Tube		48.548 [m2]	
	499 (note 1, 7) [KW]		MTD		33.7 [C]	
3	Transf. rate-finned 17.389 [W/m2 .k]		Bare Tube (C/D)		398.69/ 361.95 [W/m2k]	
			PRODUCT SIDE			
	Fluid Name Hydrocarbon				IN OUT	
	IN OUT		Density (Liq)		[kg/m3]	
	8664 x 1.1 (note 1)		Density (vap)		41.398 57.58 [kg/m3]	
	148 60		Spec. Heat (Liq)		k.J/(kg.°C)	
3	Vapor [kg/h] 9530.4 9530.4		Spec. Heat (vap)		2.285 2.001 k.J/(kg.°C)	
			Conduct. (Liq)		[W/Mk]	
			Conduct. (vap)		0.0483 0.036 [W/Mk]	
			Viscosity (Liq)		[cp]	
			Viscosity (Vap)		0.0144 0.0121 [cp]	
3	Inlet pressure [barg] 54.8		Velocity		4.21 2.93 [m/s]	
	Fouling resist. [m2.k/w] 0.0002		Allo/Calc. Press.Drop		0.700 / 0.091 [bar]	
			AIR SIDE			
3	AirQuantity, Total (Per Unit) 27.1 [m3/s]		Face Velocity:		2.9 [m/s]	
	13.55 [m3/s]		Altit. / Min. Des.Amb.:		12.5 / 5 [m]/[C]	
3	Static pressure 142.13 [Pa]		Temp.In / Out :		50.26 / 67.97 [C]	
			DESIGN			
	Design pressure 62 [Barg]		Code Requirements		ASME VIII DIV.1 ; API 661	
	Design temperature 175 [C]		TUBE			
	Test pressure 80.60 [Barg]		Material		SA-213 TP316L	
	BAY width [m] 2.118		Outside Diameter		25.4 [mm]	
	Bundle Size 2.06 x 3.900		Wall Thickness		1.651 [mm]	
	N .Bay 1		N ./Bundle		156	
	N .Bundles / Bay 1		Length		3.9 [m]	
	N .Tube Rows 6		Pitch		69 [mm]	
	N .Passes 4		FIN			
	Tube slope 1% on last pass		Type		EXTRUDED	
	HEADER		Material		ALUMINIUM alloy 1060 - O	
	Type Plug		Outside Diameter		57.15 [mm]	
	Material SA-240 TP316L		Stock Thick.		0.48 [mm]	
	Header Design / SPLIT Shoulder/No		FPI		10	
	Plug Mat SA 182 F316L		MISCELLANEOUS			
	Gasket Mat Solid Metal		Structural Mounting		Ground	
	Corrosion Allow. 0 [mm]		Bundle Frame		H.D.G	
	Qty / Size nozzle IN 1 X4" (80S)		Louvers		Yes, (Manual)	
	Qty / Size nozzle OUT 1 X4" (80S)		Vibration switches		Yes, EExd, IIB T3 (IP 65)	
	Rating & Facing (in/out) 600 RF		Steam Coil		No	
3	TI/PI Yes/ Yes (1/2")		Recirculation System		No	
	Vent / Drain Yes (2") / Yes (2") LWN #600		Tube / Tubesheet Connection.		Expanded + Strength weld	
			MECH. EQUIPMENT			
	FAN		ELECTRIC MOTOR			
	N ./Bay 2		N ./Bay		2	
	N autovvariable/bay 50%		KW / Driver		7.5	
	rev / min 658.6		rev / min		1500	
	Diameter 1450 mm		Enclosure		EExd, IIB T3 (IP 55)	
3	N .Blades 4		Volt, Phase, Cycle		400-3-50	
	Material, Blade AL		SPEED REDUCER			
	Material, Hub Steel/Alu		Type		V-Belt	
3	KW / Fan, Absorb. 3.5		N .Bay		2	
	SPL@ 1m beside. fan <85 [dB(A)]		Service Factor		1.8	
			Ratio		2.28	
	NOTES:					
	1- 10% over design on duty and flow has been considered.					
	2- Plot size is without considering side walkways.					
	3- Air side fouling factor has been considered equal to 0.00035 m2.K/w.					
	4- Thechnical Bid is 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					
	5- Maximum allowable nozzle load = 3 x API.					
	6-MDMT is considered 5 C					
	7-Physical properties changed based on last revision of PFD Doc.No:BK-GCS-HY-120-PR-PF-0001-V04-AP					

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج کولرهای هوایی ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0015_02)							 	
شماره پیمان: 053 – 073 – 9184	Process Data Sheet for AE-2102 (A/B/C)							شماره صفحه : 6 از 6	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	AA	120	PR	DS	0002	V03	



AAC		AIR COOLED HEAT EXCHANGER		Date : 2024.Sep-30	
		ABAN AIR COOLER CO		Rev : 3	
				CASE: 00012-AC-3991	
Customer / Purch.		(PEDCO) / (NISOC)		Item no.: AE-2102 (A/B/C)	
Plant location		Binak oilfield		Winter case	
Service		2st Stage Gas Compression Cooler		No. Units: 3	
Plot size(W,L) [m]		2.12 x 3.90 (note2)		No. of bay: 1	
3	Surface / unit-Finned	1010.5	[m2]	Bare Tube	48.548 [m2]
3	Heat exchanged	451.9 (Note 1)	[KW]	MTD	34.6 [C]
3	Transf. rate-finned	16.708	[W/m2 .k]	Bare Tube (C/D)	381.55/ 347.77 [W/m2k]
PRODUCT SIDE					
Fluid Name		Hydrocarbon		IN OUT	
		IN	OUT		
Total Fluid [kg/h]		7585 x 1.1 (note 1)		Density (Liq)	[kg/m3]
Temperature [C]		149	60	Density (vap)	35.72 48.434 [kg/m3]
Vapor [kg/h]		8343.5	8343.5	Spec.Heat (Liq)	kJ/(kg .C)
Liquid [kg/h]				Spec.Heat (vap)	2.34 2.04 kJ/(kg .C)
N condensed [kg/h]				Conduct. (Liq)	[W/Mk]
Steam [kg/h]				Conduct. (vap)	0.051 0.038 [W/Mk]
Water [kg/h]				Viscosity (Liq)	[cp]
Inlet pressure [barg]		54.8		Viscosity (Vap)	0.0149 0.0125 [cp]
Fouling resist. [m2.k/w]		0.0002		Velocity	4.34 3.2 [m/s]
		Allo/Calc. Press.Drop		0.700 / 0.083	[bar]
AIR SIDE					
3	AirQuantity, Total (Per Unit)	26.96	[m3/s]	Face Velocity:	2.9 [m/s]
3	AirQuant./Fan	13.48	[m3/s]	Altit. / Min. Des.Amb.:	12.5 / 5 [m]/[C]
3	Static pressure	141.64	[Pa]	Temp. In / Out :	50.26 / 66.3 [C]
DESIGN					
Design pressure		62	[Barg]	Code Requirements ASME VIII DIV.1 ; API 661	
Design temperature		175	[C]	TUBE	
Test pressure		80.60	[Barg]	Material SA-213 TP316L	
BAY width [m]		2.118		Outside Diameter 25.4 [mm]	
Bundle Size		2.06 x 3.900		Wall Thickness 1.651 [mm]	
N .Bay		1		N .Bundle 156	
N .Bundles / Bay		1		Length 3.9 [m]	
N .Tube Rows		6		Pitch 69 [mm]	
N .Passes		4		FIN	
Tube slope		1% on last pass		Type EXTRUDED	
HEADER				Material ALUMINIUM alloy 1060 - O	
Type		Plug		Outside Diameter 57.15 [mm]	
Material		SA-240 TP316L		Stock Thick. 0.48 [mm]	
Header Design / SPLIT		Shoulder/No		FPI 10	
Plug Mat		SA 182 F316L		MISCELLANEOUS	
Gasket Mat		Solid Metal		Structural Mounting Ground	
Corrosion Allow.		0	[mm]	Bundle Frame H.D.G	
Qty / Size nozzle IN		1 X4" (80S)		Louvers Yes, (Manual)	
Qty / Size nozzle OUT		1 X4" (80S)		Vibration switches Yes, EExd, IIB T3 (IP 65)	
Rating & Facing (in/out)		600 RF		Steam Coil No	
3	T/PI	Yes / Yes (1/2")		Recirculation System No	
Vent / Drain		Yes (2") / Yes (2") LWN #600		Tube / Tubesheet Connection. Expanded + Strength weld	
MECH. EQUIPMENT					
ELECTRIC MOTOR					
N .Bay		2		N .Bay 2	
N .autovvariable/bay		50%		KW / Driver 7.5	
rev / min		658.6		rev / min 1500	
Diameter		1450	mm	Enclosure EExd, IIB T3 (IP 55)	
3	N .Blades	4		Volt, Phase, Cycle 400-3-50	
Material, Blade		AL		SPEED REDUCER	
Material, Hub		Steel/Alu		Type V-Belt	
KW / Fan, Absorb.		4.8		N .Bay 2	
				Service Factor 1.8	
SPL@ 1m beside. fan		<85	[dB(A)]	Ratio 2.28	
NOTES:					
1- 10% over design on duty / flow has been considered.					
2- Plot size is without considering side walkways.					
3- Air side fouling factor has been considered equal to 0.00035 m2.K/w.					
4- Technical Bid is 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					
5- Maximum allowable nozzle load = 3 x API.					
6-MDMT is considered 5C					
9-Physical properties changed based on last revision of PFD Doc.No.BK-GCS-HY-120-PR-PF-0001-V04-AP					