

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک (قرارداد BK-HD-GCS-CO-0008_03)						
شماره پیمان: 053 - 073 - 9184	DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES					شماره صفحه: 1 از 24	
طرح نگهداشت و افزایش تولید ۲۷ مخزن							
DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES نگهداشت و افزایش تولید میدان نفتی بینک							
Rev	Date	Purpose of Issue / Status	Prepared By	Checked By	Approved By	Client Approval	
V03	MAR.2025	IFR	Havayar Co.	M. Fakharian	S.Faramarzpour		
V02	DEC.2023	IFR	Havayar Co.	M. Fakharian	A.M. Mehrsha		
V01	JUN.2023	IFR	Havayar Co.	M. Fakharian	A.M. Mohseni		
V00	FEB.2023	IFR	Havayar Co.	M. Fakharian	A.M. Mohseni		

Status IFA: Issued for Approval
 IFR: Issued for Review
 IFI: Issued for Information
 AFC: Approved for Construction



نگهداشت و افزایش تولید میدان نفتی بینک

سطح الارض و ابنیه تحت الارض

خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک
(قرارداد BK-HD-GCS-CO-0008_03)



شماره پیمان:
053 - 073 - 9184

DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
V03	0001	DS	ME	120	HY	GCS	BK

شماره صفحه : 2 از 24

PAGE	V00	V01	V02	V03	V04
1	X	X	X	X	
2	X	X	X	X	
3	X	X	X	X	
4	X	X	X	X	
5	X	X	X	X	
6	X		X	X	
7	X		X	X	
8	X		X	X	
9	X	X	X	X	
10	X	X	X	X	
11	X	X	X	X	
12	X	X	X	X	
13	X	X	X	X	
14	X	X	X	X	
15	X	X	X	X	
16	X	X	X	X	
17	X	X	X	X	
18	X	X	X	X	
19	X	X		X	
20	X	X	X	X	
21	X	X		X	
22	X	X		X	
23	X	X	X		
24		X	X	X	
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PAGE	V00	V01	V02	V03	V04
36					
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نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض
خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک
(قرارداد BK-HD-GCS-CO-0008_03)



DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES

شماره صفحه: 3 از 24

شماره پیمان:
053 - 073 - 9184

نسخه سریال نوع مدرک رشته تسهیلات صادرکننده بسته کاری پروژه
BK GCS HY 120 ME DS 0001 V03

1	APPLICABLE TO:	☐ PROPOSALS	☒ PURCHASE	☐ AS BUILT								
2	FOR/USER	NISOC		SITE/LOCATION	Binak Oil Field	SERVICE	Sour Gas	NO. REQ'D	3(2Operating/1Spare)			
3	NOTE:	☐ INDICATES INFO. TO BE COMPLETED BY PURCH.								☐ BY MANUFACTURER WITH PROPOSAL	☒ BY MANUFACTURER AFTER ORDER	☒ BY MANUFACTURER OR PURCHASER AS APPLICABLE
5	COMPR. MFR	Havayar / Kwangshin		TYPE MODEL NO(S)	KSOPT		SERIAL NO(S)	C-2101&C-2102 A/B/C (SR23006)				
6	COMPR.THROWS: TOTAL NO.	2		NO. WITH CYLS.	2		NOMINAL FRAME RATING	1070	BkW @ RATED R/MIN OF	424 (14P)		
7		☐ MAX/MIN ALLOWABLE SPEED / r/min										
8	DRIVER MFR	Wolong Nanyang		DRIVER NAMEPLATE kW/OPERATING r/min	1070 @ Site condition		/	424 (14P)				
9	DRIVE SYSTEM:	☒ DIRECT COUPLED ☐ GEARED & COUPLED ☐ V-BELT										
10	TYPE OF DRIVER:	☒ IND. MOTOR ☐ SYN. MOTOR ☐ STEAM TURBINE ☐ GAS TURBINE ☐ ENGINE ☐ OTHER										
11	CYLINDERS CONSTRUCTION:	☒ LUBE ☐ NON-LUBE										
13	MAX ACCEPTABLE AVG PISTON SPEED	4 m/s										
14	OPERATING CONDITIONS (EACH MACHINE)											
15	SERVICE OR ITEM NO.	Continuous	Continuous	Continuous	Continuous							
16	STAGE	1st	2nd	1st	2nd							
17	NORM. OR ALT. CONDITION	Summer		Winter								
18	CERTIFIED PT. (X) MARK ONE	x										
19	MOLECULAR WEIGHT	24.52	24.52	21.56	21.56							
20	Cp/Cv (K) @ 65°C OR	1.245	1.278	1.28	1.295							
21	INLET CONDITIONS:	AT INLET TO: ☒ PULSE DEVICES ☒ COMPRESSOR CYLINDER FLANGES										
22		NOTE: ☐ SIDE STREAM TO STAGE(S), THESE INLET PRESS. ARE FIXED										
23	PRESSURE (barg) @ PUL. SUPP. INLET	4.9	16.956	4.9	16.956							
24	PRESSURE (barg) @ CYL. FLANGE	4.805	16.856	4.805	16.856							
25	TEMPERATURE (°C)	36.8	59.9	18.9	59.9							
26	REC: SIDE STREAM TEMPS (°C)											
27	COMPRESSIBILITY (Z _s)	0.975	0.936	0.977	0.951							
28	INTERSTAGE:	INTERSTAGE Δ P INCL: ☐ PULSE DEVICES ☐ PIPING ☐ COOLERS ☐ SEPARATORS ☐ OTHER										
29	ΔP BETWEEN STAGES, %/bar											
30	DISCHARGE CONDITIONS:	AT OUTLET FROM: ☒ PULSE DEVICE ☒ COMP. CYL. FLANGES ☐ OTHER										
31	PRESSURE (barg) @ CYL. FLANGE	17.956	54.898	17.956	54.898							
32	PRESS. (barg) @ PUL. SUPP. OUTLET	17.856	54.8	17.856	54.8							
33	TEMP., ADIABATIC, °C	117.9	153.7	105	158.7							
34	TEMP., PREDICTED, °C	129	148	116	149							
35	COMPRESSIBILITY (Z ₂) OR (Z _{AVG})	0.964	0.923	0.970	0.948							
36	* CAPACITY AT INLET TO COMPRESSOR, NO NEGATIVE TOLERANCE (-0%)											
37	kg/h	8664	8664	7585	7585							
38	IS ☒ WET ☐ DRY											
39	Nm ³ /h (1 atm & 0 °C)	7918	7918	7887	7887							
40	* MFR.'S RATED CAPACITY (AT INLET TO COMPRESSOR & kW @ CERTIFIED TOLERANCE OF ±3% FOR CAP. & ±3% FOR kW)											
41	kg/h	8935.5	8935.5	8343.5	8343.5							
42	IS ☒ WET ☐ DRY											
43	INLET VOLUME FLOW (m ³ /h)	1613.1		1613.1								
44	Nm ³ /h (1.013 bar & 0°C)	8162.9	8162.9	8668.6	8668.6							
45	BkW/STAGE	441.1	463.0	435.2	481.3							
46	TOTAL BkW @ COMPRESSOR SHAFT	904.1		916.5								
47	TOTAL kW INCLUDING V-BELT & GEAR LOSSES											
49	* CAPACITY FOR NNT	REMARKS: 10% over design is considered for winter case has been considered (8343.5 kg/h)										
50	MANUFACTURER'S = REQUIRED ÷ 0.97	10% over-design is considered for winter case based on basic documents.										
51	THEREFORE REQUIRED = MFR'S x 0.97	Total kW including loss at PSV set pressure (62 barg): 963.9 kw										

		نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنيه تحت الارض خرید پکیج های کمپرسور گاز (دفت و برگشتی) بینک (قرارداد BK-HD-GCS-CO-0008_03)									
شماره پیمان: 053 - 073 – 9184		DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES							شماره صفحه : 4 از 24		
		نسخه سریال نوع مدرک رشته تسهیلات صادر کننده بسته کاری پروژه									
		BK GCS HY 120 ME DS 0001 V03									
GAS ANALYSIS AT OPERATING CONDITIONS										REMARKS	
MOLE % (BY VOLUME) ONLY											
☐ SERVICE/ITEM NO.			Continious		Continious		Continious				
☐ STAGE			1st		2nd		1st				
☐ NORMAL OR ALT			Summer		Winter						
M.W.											
AIR			28.966								
OXYGEN O ₂			32.000								
NITROGEN N ₂			28.016		0.2984		0.2984		0.3101		
WATER VAPOR H ₂ O			18.016		1.0314		1.0314		0.3638		
CARBON MONOX. CO			28.010								
CARBON DIOX. CO ₂			44.010		3.1606		3.1606		2.5202		
HYDRO. SULFIDE H ₂ S			34.076		5.4119		5.4119		4.7056		
HYDROGEN H ₂			2.016								
METHANE CH ₄			16.042		63.8921		63.8921		73.9809		
ETHYLENE C ₂ H ₄			28.052								
ETHANE C ₂ H ₆			30.068		13.7515		13.7515		11.4249		
PROPYLENE C ₃ H ₆			42.078								
PROPANE C ₃ H ₈			44.094		7.7314		7.7314		4.7371		
I-BUTANE C ₄ H ₁₀			58.120		0.8394		0.8394		0.3942		
n-BUTANE C ₄ H ₁₀			58.120		1.8594		1.8594		0.8130		
I-PENTANE C ₅ H ₁₂			72.146		0.6968		0.6968		0.3066		
n-PENTANE C ₅ H ₁₂			72.146		0.3774		0.3774		0.1450		
n-HEXANE C ₆ H ₁₄			86.180		0.6549		0.6549		0.2224		
n-HEPTANE C ₇ H ₁₆			100.20		0.1956		0.1956		0.0542		
n-OCTANE C ₈ H ₁₈			114.23		0.0596		0.0596		0.0149		
n-NONANE C ₉ H ₂₀			128.26		0.0297		0.0297		0.0071		
n-DECANE C ₁₀ H ₂₂			142.28		0.0099		0.0099		0.0000		
AMMONIA NH ₃			17.031								
HYDRO. CHLOR. HCl			36.461								
CHLORINE Cl ₂			70.914								
CHLORIDES - TRACES											
☐ CALCULATED MOL WT.			24.52		24.52		21.56		21.56		
☐ C _p /C _v (K)@ Suction Line Temperature °C			1.245		1.278		1.28		1.295		
NOTE: IF WATER VAPOR AND/OR CHLORIDES ARE PRESENT, EVEN MINUTE TRACES, IN THE GAS BEING COMPRESSED, IT MUST BE INCLUDED ABOVE.											
☐ SITE/LOCATION CONDITIONS NOTE 22											
ELEVATION 12.5 m 0.99 bar AMBIENT TEMPS: MAX 55 °C MIN 5 °C											
☐ MIN DESIGN METAL TEMP °C (6.15.8.1) RELATIVE HUMIDITY: MAX 100 % MIN 0 %											
COMPRESSOR LOCATION: ☐ INDOOR ☐ HEATED ☐ UNHEATED ☐ AT GRADE LEVEL ☐ ELEVATED: m											
☐ OUTDOOR ☐ NO ROOF ☒ UNDER ROOF ☐ PARTIAL SIDES ☐ PLATFORM: ☐ ON-SHORE											
☐ OFF-SHORE ☐ WEATHER PROTECTION REQ. ☐ TROPICALIZATION REQ.											
☐ WINTERIZATION REQUIRED											
UNUSUAL CONDITIONS: ☒ CORROSIVES ☐ DUST ☐ FUMES ☐ OTHER											
ELECTRICAL CLASSIFICATIONS											
HAZARDOUS											
NON-HAZARDOUS											
MAIN UNIT ☒ ZONE 2 GROUP GR.IIB TEMP CLASS T4 ☐											
L.O. CONSOLE ☒ ZONE 2 GROUP GR.IIB TEMP CLASS T4 ☐											
CW CONSOLE ☒ ZONE 2 GROUP GR.IIB TEMP CLASS T4 ☐											



نگهداشت و افزایش تولید میدان نفتی بینک

سطح الارض و ابنیه تحت الارض

خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک
(قرارداد BK-HD-GCS-CO-0008_03)



شماره پیمان:

053 - 073 - 9184

DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES

شماره صفحه : 5 از 24

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
V03	0001	DS	ME	120	HY	GCS	BK

PART LOAD OPERATING CONDITIONS

1 CAPACITY CONTROL BY: ☐ MFG'S CAP. CONTROL ☐ PURCHASERS BY-PASS ☒ BOTH NOTE 8 ☒ OTHER _____

2 (NOTE 7) FOR: ☐ PART LOAD COND. ☐ START-UP ONLY ☒ BOTH

3 WITH: ☒ AUTO LOADING DELAY INTERLOCK (7.6.2.4) ☐ AUTO IMMEDIATE UNLOADING

4 USING: ☒ FIXED VOLUME PCK. ☒ SUCTION VALVE UNLOADERS: ☒ FINGER ☐ PLUG ☐ OTHER

5 ACTION: ☐ DIRECT (AIR-TO-UNLOAD) ☒ REVERSE (AIR-TO-LOAD/FAIL SAFE)

6 NUMBER OF STEPS: ☐ ONE ☐ THREE ☒ FIVE ☐ OTHER _____

7 ☐ RAIN COVER REQUIRED OVER UNLOADERS

ALL UNLOADING STEPS BASIS MANUFACTURERS CAPACITY SHOWN ON PAGE 3.

10 INLET AND DISCHARGE PRESSURE ARE ☒ AT CYLINDER FLANGES ☐ PULSATION SUPPRESSOR FLANGES

11	● SERVICE OR ITEM NO.	Continuous				
12	■ STAGE	1st				
13	■ NORMAL OR ALTERNATE CONDITION	Summer				
14	● PERCENT CAPACITY	0	25	50	75	100
15	● WEIGHT FLOW, kg/h	-	2233.9	4467.8	6701.6	8935.5
16	■ Nm ³ /h (1.013 bar & 0°C)	-	2040.7	4081.5	6122.2	8162.9
17	POCKETS/VALVES OPERATION *	HE S & CE S	HE F & CE S	HE S or CE S	HE F	-
18	■ POCKET CLEARANCE ADDED %		25% (Head Side)		25% (Head Side)	
19	■ TYPE UNLOADERS, PLUG/FINGER	Finger	Finger	Finger	Finger	Finger
20	■ INLET TEMPERATURE, °C	36.8	36.8	36.8	36.8	36.8
21	■ INLET PRESSURE, barg	4.900	4.900	4.900	4.900	4.900
22	■ DISCHARGE PRESSURE, barg	17.856	17.856	17.856	17.856	17.856
23	□ DISCHARGE TEMP., ADIABATIC °C	117.9	117.9	117.9	117.9	117.9
24	■ DISCHARGE TEMP., PREDICTED °C	129.0	129.0	129.0	129.0	129.0
25	■ VOLUMETRIC EFF., %HE/%CE	73.57 / 73.57	73.57 / 73.57	73.57 / 73.57	73.57 / 73.57	73.57 / 73.57
26	■ CALC. GAS ROD LOAD, kN, C **	3.7	236.9	239.6	236.9	236.9
27	■ CALC. GAS ROD LOAD, kN, T **	3.7	3.7	3.7	221.2	221.2
28	◆ COMB. ROD LOAD, kN C (GAS & INERTIA)	133	133	189	130.7	189
29	◆ COMB. ROD LOAD, kN T (GAS & INERTIA)	173.4	3.4	107.5	158.1	158.1
30	◆ ROD REV., DEGREES MIN @ X-HD PIN ***	199.9	19.3	64.7	168.2	187.2
31	■ kW/STAGE	210.0	267.8	325.5	383.2	441.0
32	■ TOTAL kW @ COMPRESSOR SHAFT	420	541	662	782.9	903.9
33	■ TOTAL kW INCL. V-BELT & GEAR LOSSES					
34						

* SHOW OPERATION WITH THE FOLLOWING SYMBOLS:

HEAD END = HE	} PLUS {	SUCTION VALVE(S) UNLOADED = S
OR		OR
CRANK END = CE		FIXED POCKET OPEN = F
		OR
		VARIABLE POCKET OPEN = V

EXAMPLE: HE-F/CE-S = HEAD END FIXED POCKET OPEN / CRANK END SUCTION VALVE(S) UNLOADED.

** C = COMPRESSION T = TENSION *** X - HD = CROSSHEAD

44 ■ MINIMUM PRESSURE REQUIRED TO OPERATE CYLINDER UNLOADING DEVICES, 4 barg

45 CYLINDER UNLOADING MEDIUM: ☒ AIR ☐ NITROGEN ☐ OTHER

46 ● PRESSURE AVAILABLE FOR CYLINDER UNLOADING DEVICES, MAX/MIN 8.5 / 3 barg

47 REMARKS, SPECIAL REQUIREMENTS, AND/OR SKETCH

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک (قرارداد BK-HD-GCS-CO-0008_03)	 HAVAYAR INDUSTRIAL GROUP
شماره پیمان: 053 - 073 - 9184	DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES	
	نسخه سریال نوع مدرک رشته تسهیلات صادرکننده بسته کاری پروژه	
	V03 0001 DS ME 120 HY GCS BK	
شماره صفحه : 6 از 24		

PART LOAD OPERATING CONDITIONS																																																																																																																													
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شماره پیمان: 053 - 073 - 9184	DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES	شماره صفحه: 7 از 24
	نسخه سریال نوع مدرک رشته تسهیلات صادرکننده بسته کاری پروژه V03 0001 DS ME 120 HY GCS BK	

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11 ☒ SERVICE OR ITEM NO. 12 ☒ STAGE 13 ☒ NORMAL OR ALTERNATE CONDITION 14 ☒ PERCENT CAPACITY 15 ☒ WEIGHT FLOW, kg/h 16 ☐ Nm ³ /h (1.013 bar & 0°C) 17 ☐ POCKETS/VALVES OPERATION * 18 ☒ POCKET CLEARANCE ADDED % 19 ☒ TYPE UNLOADERS, PLUG/FINGER 20 ☒ INLET TEMPERATURE, °C 21 ☒ INLET PRESSURE, barg 22 ☒ DISCHARGE PRESSURE, barg 23 ☐ DISCHARGE TEMP., ADIABATIC °C 24 ☐ DISCHARGE TEMP., PREDICTED °C 25 ☒ VOLUMETRIC EFF., %HE/%CE 26 ☒ CALC. GAS ROD LOAD, kN, C ** 27 ☒ CALC. GAS ROD LOAD, kN, T ** 28 ☒ COMB. ROD LOAD, kN C (GAS & INERTIA) 29 ☒ COMB. ROD LOAD, kN T (GAS & INERTIA) 30 ☒ ROD REV., DEGREES MIN @ X-HD PIN *** 31 ☒ kW/STAGE 32 ☒ TOTAL kW @ COMPRESSOR SHAFT 33 ☒ TOTAL kW INCL. V-BELT & GEAR LOSSES	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr> <th colspan="5">Continuous</th> </tr> <tr> <th colspan="5">2nd</th> </tr> <tr> <th colspan="5">Winter</th> </tr> <tr> <th>0</th> <th>25</th> <th>50</th> <th>75</th> <th>100</th> </tr> <tr> <td>-</td> <td>2085.9</td> <td>4171.8</td> <td>6257.6</td> <td>8343.5</td> </tr> <tr> <td>-</td> <td>2167.2</td> <td>4334.3</td> <td>6501.5</td> <td>8668.6</td> </tr> <tr> <td>HE S & CE S</td> <td>HE F & CE S</td> <td>HE S or CE S</td> <td>HE F</td> <td>-</td> </tr> <tr> <td colspan="2">25% (Head Side)</td> <td colspan="2">25% (Head Side)</td> <td></td> </tr> <tr> <td>Finger</td> <td>Finger</td> <td>Finger</td> <td>Finger</td> <td>Finger</td> </tr> <tr> <td>59.9</td> <td>59.9</td> <td>59.9</td> <td>59.9</td> <td>59.9</td> </tr> <tr> <td>16.956</td> <td>16.956</td> <td>16.956</td> <td>16.956</td> <td>16.956</td> </tr> <tr> <td>54.800</td> <td>54.800</td> <td>54.800</td> <td>54.800</td> <td>54.800</td> </tr> <tr> <td>158.7</td> <td>158.7</td> <td>158.7</td> <td>158.7</td> <td>158.7</td> </tr> <tr> <td>149.0</td> <td>149.0</td> <td>149.0</td> <td>149.0</td> <td>149.0</td> </tr> <tr> <td>76.71/76.71</td> <td>76.71/76.71</td> <td>76.71/76.71</td> <td>76.71/76.71</td> <td>76.71/76.71</td> </tr> <tr> <td>11.5</td> <td>244.5</td> <td>244.5</td> <td>244.5</td> <td>244.5</td> </tr> <tr> <td>11.5</td> <td>11.5</td> <td>11.5</td> <td>197.4</td> <td>197.4</td> </tr> <tr> <td>122.1</td> <td>208.1</td> <td>208.1</td> <td>161.1</td> <td>208.1</td> </tr> <tr> <td>140</td> <td>73.7</td> <td>73.7</td> <td>146.6</td> <td>146.6</td> </tr> <tr> <td>206.2</td> <td>53.5</td> <td>53.5</td> <td>159.5</td> <td>182.3</td> </tr> <tr> <td>210.0</td> <td>277.8</td> <td>345.7</td> <td>413.5</td> <td>481.3</td> </tr> <tr> <td>420</td> <td>544.1</td> <td>668.2</td> <td>792.2</td> <td>916.3</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>					Continuous					2nd					Winter					0	25	50	75	100	-	2085.9	4171.8	6257.6	8343.5	-	2167.2	4334.3	6501.5	8668.6	HE S & CE S	HE F & CE S	HE S or CE S	HE F	-	25% (Head Side)		25% (Head Side)			Finger	Finger	Finger	Finger	Finger	59.9	59.9	59.9	59.9	59.9	16.956	16.956	16.956	16.956	16.956	54.800	54.800	54.800	54.800	54.800	158.7	158.7	158.7	158.7	158.7	149.0	149.0	149.0	149.0	149.0	76.71/76.71	76.71/76.71	76.71/76.71	76.71/76.71	76.71/76.71	11.5	244.5	244.5	244.5	244.5	11.5	11.5	11.5	197.4	197.4	122.1	208.1	208.1	161.1	208.1	140	73.7	73.7	146.6	146.6	206.2	53.5	53.5	159.5	182.3	210.0	277.8	345.7	413.5	481.3	420	544.1	668.2	792.2	916.3										
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نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض

خرید پکیج های کمپرسور گاز (دفت و برگشتی) بینک
(قرارداد BK-HD-GCS-CO-0008_03)



DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES

شماره صفحه: 9 از 24

شماره پیمان:

053 - 073 - 9184

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادر کننده	بسته کاری	پروژه
V03	0001	DS	ME	120	HY	GCS	BK

● SCOPE OF BASIC SUPPLY

PURCHASER TO FILL IN (☐ ☐ ☐) AFTER COMMODITY TO INDICATE: ☐ BY COMPR. MFR. ☐ BY PURCH. ☐ BY OTHERS

● DRIVER (☒ ☐ ☐): ☐ VARIABLE SPEED SPEED RANGE _____ r/min TO _____ r/min
☒ INDUCTION MOTOR ☐ SYNCHRONOUS MOTOR ☐ STEAM TURBINE ☐ ENGINE ☐ OTHER _____
☐ API 541 ☐ API 546 ☐ API 611 ☐ API 612
☐ OUTBOARD BEARING ☐ PROVISION FOR DRY AIR PURGE FOR OUTBOARD BEARING.
● SLIDE BASE FOR DRIVER (☒ ☐ ☐) SOLE PLATE FOR DRIVER (☐ ☐ ☐)
☐ MOTOR STARTING EQUIPMENT (☐ ☒ ☐); DEFINE _____
☐ GEAR (☐ ☐ ☐): ☐ BASEPLATE FOR GEAR ☐ API 613 ☐ API 677
● COUPLING(S) (☒ ☐ ☐): ● LOW SPD. ☐ HI-SPD. ☐ QUILL SHAFT ☐ KEY-LESS DRV. ☐ KEY'D DRV. ☐ OTHER _____
● API 671
☐ V-BELT DRIVE (☐ ☐ ☐): ☐ SHEAVES & V-BELTS (☐ ☐ ☐) ☐ STATIC CONDUCTING V-BELTS ☐ BANDED V-BELTS
● DRIVE GUARD(S) (☒ ☐ ☐): ☐ MANUFACTURER'S STD. ● NON-SPARKING ☐ CALIF CODE ● API 671, ANNEX G
☐ OTHER

● PULSATION SUPPRESSORS (☒ ☐ ☐): ● INITIAL INLET & FINAL DISCHARGE ● SUPPORTS (☒ ☐ ☐)
● INTERSTAGE ● SUPPORTS (☒ ☐ ☐)
☐ SUPPRESSOR(S) TO HAVE MOISTURE REMOVAL SECTION: ☐ INITIAL INLET ☐ ALL INTERSTAGE INLET
● ACOUSTICAL SIMUL. STUDY (☒ ☐ ☐): DESIGN ☐ 1, EMPIRICAL PULSATION SUPPRESSION DEVICE SIZING
APPROACH ☐ 2, ACOUSTIC SIMULATION AND PIPING RESTRAINT ANALYSIS
CHECK ONLY ONE, SEE 7.9.4.1.1, TABLE 6) ☐ 3, ACOUSTIC SIMULATION AND PIPING RESTRAINT ANALYSIS
PLUS MECHANICAL ANALYSIS
STUDY TO CONSIDER: ● COMP. OPER. IN PARALLEL ☐ ALTERNATE GASES
ALL SPECIFIED LOAD COND., INCL. ● SINGLE ACT., PLUS ● WITH EXISTING COMP. AND PIPING SYSTEMS
☐ CRITICAL FLOW MEASUREMENT (7.9.4.2.5.3.3) ● PIPING SYSTEM FLEXIBILITY
☐ PULSATION SUPPRESS'N DEVICE LOW CYCLE FATIGUE ANALYSIS
● VENDOR REVIEW OF PURCHASER'S PIPING ARRANGEMENT

NOTE: SEE APPENDIX N FOR INFORMATION REQUIRED FOR STUDY

PACKAGED: ☐ NO ● YES (☒ ☐ ☐) DEFINE BASIC SCOPE OF PACKAGING IN REMARKS SECTION, PAGE 5
☐ DIRECT GROUTED ☐ CEMENTED/MORTAR GROUT ☒ EPOXY GROUT; MFG/TYPE _____ / _____
☐ RAILS ☒ CHOCK BLOCKS ● SHIMS ● BASEPLT. ● SKID ☐ SOLEPLT. ☐ BOLTS OR STUDS FOR SOLEPLT. TO FRAME
☐ SUITABLE FOR COLUMN MOUNTING (UNDER SKID AND/OR BASEPLATE)
● LEVELING SCREWS ☐ NON-SKID DECKING ☐ SUB SOLEPLATES
● INTERCLR(S) (☐ ☒ ☐) ● OFF MOUNTED ☐ MACHINE MTD. ● AFTERCLR(S) (☐ ☒ ☐)
● SEPARATOR(S) (☐ ☒ ☐) ● CONDENSATE SEPARATION & COLLECTION FACILITY SYSTEM (7.8.2.1)
☐ INTERSTAGE PIP. (☐ ☒ ☐): ☐ FINAL DISC. PIP. (☐ ☐ ☐): ☐ PARTIAL PRE FAB, FIELD FIT ☐ SHOP FITTED
FLANGE FINISH ☐ API 618 FLANGE FINISH > 125 < 250 (7.9.5.1.16) ● FLANGE FINISH PER ANSI 16.5 ☐ SPECIAL FINISH
☐ SPECIAL PIPING REQUIREMENTS (7.7.1.13). (DEFINE IN REMARKS SECTION NEXT PAGE)
☐ INITIAL INLET, ☐ INTERSTAGE SUCTION PIPING ARR'D FOR: ● INSULATION (☒ ☐ ☐) ● HEAT TRACING (☒ ☐ ☐)
● INLET STRAINER(S) (☒ ☐ ☐): ● INITIAL INLET ☐ SIDESTREAM INLET ● SPOOL PIECE FOR INLET STRAINERS
● MANIFOLD PIPING; ● DRAINS ● VENTS ☐ RELIEF VALVES ☐ AIR/GAS SUPPLY
● RELIEF VALVE(S) (☒ ☐ ☐): ☐ INITIAL INLET ● INTERSTAGE ● FINAL DISCHARGE
☐ RUPTURE DISC(S) (☐ ☐ ☐) ☐ THRU STUDS IN PIPING FLANGES
☐ FOR ATMOSPHERIC INLET AIR COMPR. ONLY: ☐ INLET AIR FILTER (☐ ☐ ☐) ☐ INLET FILTER -SILENCER (☐ ☐ ☐)
● PREFERRED TYPE OF CYLINDER COOLING (☒ ☐ ☐): ● FORCED ☐ THERMOSYPHON _____ STAGE CYL(S)
☐ STATIC (STAND-PIPE) _____ STAGE CYL(S)
NOTE: MANUFACTURER SHALL RECOMMEND
BEST TYPE OF COOLING AFTER
FINAL ENGINEERING REVIEW OF ALL
OPERATING CONDITIONS ● CYL. COOLANT PIPING BY (☒ ☐ ☐) ● MATCH M'RKED
● SINGLE INLET/OUTLET MANIFOLD & VALVES ● SIGHT GL'SS(ES)
● INDIVIDUAL INLET/ OUTLET PER CYL. ● VALVE(S)
● CLOSED SYSTEM WITH PUMP, COOLER, SURGE TANK, & PIPING

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج های کمپرسور گاز (دفت و برگشتی) بینک (قرارداد BK-HD-GCS-CO-0008_03)	 HAVAYAR INDUSTRIAL GROUP																
شماره پیمان: 053 - 073 - 9184	DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES	شماره صفحه : 10 از 24																
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V03	0001	DS	ME	120	HY	GCS	BK											

● SCOPE OF BASIC SUPPLY (Con't)

● SEPARATE COOLING CONSOLE (☒ ☐ ☐): ● ONE FOR EA. TAG ☐ ONE CMMN TO ALL UNITS ● DUAL PUMPS (AUX. & MAIN)
 ● ARRANGED FOR HEATING JACKET WATER AS WELL AS COOLING ☐ SHOP RUN
 ● ROD PRESS. PACKING COOLING SYSTEM (☐ ☐ ☐): ☐ SEPARATE CONSOLE ● COMBINE WITH JKT SYSTEM ☐ FILTERS
 ● FRAME LUBE OIL SYSTEM (☒ ☐ ☐): ● AUX. PUMP ● DUAL FILTERS WITH TRANSFER VALVE ● SHOP RUN
☐ CONTINUOUS FLOW IN SENSING LINE TO PRESSURE SWITCHES
 ● SEPARATE LUBE OIL CONSOLE (☒ ☐ ☐): ☒ EXTENDED TO MOTOR OUTBOARD BEARING ● SHOP RUN
 Note: Compressor Package Inlet and Outlet Lines and Counter Flanges (+gaskets) Shall Be Supplied by Vendor

● CAPACITY CONTROL (☒ ☐ ☐): ● SEE DATA SHEET PAGE 3 FOR DETAILS ● IN INSTRUMENT & CONTROL PANEL
☐ SEPARATE MACHINE MOUNTED PANEL ☐ SEPARATE FREE STANDING PANEL
 ● PNEUMATIC ☐ ELECTRIC ☐ ELECTRONIC ☐ HYDRAULIC
 ● PROGRAMMABLE CONTROLLER NOTE19

● INSTRUMENT & CONTROL PANEL (☒ ☐ ☐): ● ONE FOR EACH TRAIN ☐ ONE COMMON TO ALL TRAIN
☐ MACHINE MOUNTED ● FREE STANDING (OFF UNIT)
 ○ BUFFER GAS CONTROL PANEL (☐ ☐ ☐): ☐ ONE FOR EACH UNIT ☐ ONE COMMON TO ALL UNITS
☐ MACHINE MOUNTED ☐ FREE STANDING (OFF UNIT)

SEE INSTRUMENTATION DATA SHEETS FOR DETAILS OF PANEL, ADDITIONAL REMARKS, AND INSTRUMENTATION.

NOTE: ALL TUBING, WIRING, & CONNECTIONS BETWEEN OFF-UNIT FREE STANDING PANELS AND COMPRESSOR UNIT BY PURCHASER.

● HEATERS (☒ ☐ ☐): ● FRAME LUBE OIL ● CYL. LUBRICATORS ● COOLING WATER ☐ DRIVER(S) ☐ GEAR OIL
 ● ELECTRIC ☐ STEAM

● BARRING DEVICE (☒ ☐ ☐): ☐ MANUAL ☐ PNEUMATIC ● ELECTRIC ☐ FLYWHEEL LOCKING DEVICE (☐ ☐ ☐)
 ○ CRANKCASE RAPID PRESSURE RELIEF DEVICE(S) (☐ ☐ ☐)

● SPECIAL CORROSION PROTECTION: ☐ NO ● YES ☐ MFR'S STANDARD ● OTHER NACE MR0175 for wetted pipes
 ○ HYDRAULIC TENSIONING TOOLS ☐ NO ☐ YES

● MECHANICAL RUN TEST: ☐ NO ● YES ☐ MFG'S STANDARD ● OTHER MFR. Procedure (Approved by Purchaser)
☐ COMPLETE SHOP RUN TEST OF ALL MACHINE MOUNTED EQUIPMENT, PIPING & APPURT.(S)

PAINTING: ● MANUFACTURER'S STANDARD ● SPECIAL AS PER: BK-GNRL-PEDCO-000-PI-SP-0006
 NAMEPLATES: ☐ U.S. CUSTOMARY UNITS ● SI UNITS
 SHIPMENT: ☒ DOMESTIC ☒ EXPORT ☐ EXPORT BOXING REQUIRED (☐ ☐ ☐)
 ● STANDARD 6 MONTH STORAGE PREPARATION (☐ ☐ ☐), PER SPEC
 ● OUTDOOR STORAGE FOR OVER 6 MONTHS (☒ ☐ ☐), PER SPEC MFG's Procedure (12 month from shipment)

● INITIAL INSTALLATION AND OPERATING TEMP ALIGNMENT CHECK AT JOBSITE BY VENDOR REPRESENTATIVE
 ○ COMPRESSOR MANUFACTURER'S USER'S LIST FOR SIMILAR SERVICE
 ● COMPRESSOR VALVE DYNAMIC RESPONSE
 ● PERFORMANCE DATA REQUIRED (9.3.3): ● BHP VS. SUCTION PRESSURE CURVES
 ● ROD LOAD/GAS LOAD CHARTS
☐ VALVE FAILURE DATA CHARTED
 ● SPEED/TORQUE CURVE DATA
 ● BkW VS. CAPACITY PERFORMANCE CURVES OR TABLES REQUIRED FOR UNLOADING STEPS AND/OR VARIABLE SUCTION/DISCHARGE PRESSURES

REMARKS:



نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض

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DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES

شماره صفحه : 11 از 24

شماره پیمان:

053 - 073 - 9184

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
V03	0001	DS	ME	120	HY	GCS	BK

UTILITY CONDITIONS

ELECTRICAL POWER:	AC VOLTS	/	PHASE	/	HERTZ	DC VOLTS	AC VOLTS	/	PHASE	/	HERTZ	DC VOLTS
● MAIN DRIVER	11000	/	3	/	50		INSTRUMENT	110	/	1	/	50
● AUXILIARY MOTORS	400	/	3	/	50		ALARM & SHTDWN	230	/	1	/	50
● HEATERS	230	/	1	/	50							

Note: Heater below than 3kw is 230Vac.

INSTRUMENT AIR:	NORMAL PRESSURE	4	barg	MAX/MIN	8.5	/	4	barg	Note 24
NITROGEN:	NORMAL PRESSURE	7.5	barg	MAX/MIN		/		barg	

<u>STEAM</u> FOR: <u>DRIVERS</u>				<u>HEATERS</u>			
INLET: PRESS	barg	MAX/MIN	/	INLET: PRESS	barg	MAX/MIN	/
(NORM.) TEMP	°C	MAX/MIN	/	(NORM.) TEMP	°C	MAX/MIN	/
EXH'ST: PRESS	barg	MAX/MIN	/	EXH'ST: PRESS	barg	MAX/MIN	/
(NORM.) TEMP	°C	MAX/MIN	/	(NORM.) TEMP	°C	MAX/MIN	/

<u>COOLING WATER</u> FOR: <u>COMPRESSOR CYLINDERS</u>				<u>COOLERS</u>			
TYPE WATER				TYPE WATER			
SUPP.: PRESS	3	barg	MAX/MIN	SUPP.: PRESS	barg	MAX/MIN	/
(NORM.) TEMP	63	°C	MAX/MIN	(NORM.) TEMP	°C	MAX/MIN	/
R'T'RN: PRESS	barg	MAX/MIN	/	R'T'RN: PRESS	barg	MAX/MIN	/
(NORM.) TEMP	70	°C	MAX/MIN	(NORM.) TEMP	°C	MAX/MIN	/

COOLING FOR ROD PACKING:

TYPE FLUID	GLYCOL H2O	SUPPLY PRESSURE	3	barg @	63	°C	RETURN	barg @	70	°C
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FUEL GAS:	NORMAL PRESSURE	barg	MAX/MIN	/	barg	LHV	MJ/m ³
COMPOSITION							

REMARKS/SPECIAL REQUIREMENTS:

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک (قرارداد BK-HD-GCS-CO-0008_03)																																																																																																																																																																																																																																																																																																
شماره پیمان: 053 - 073 - 9184	DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES <table border="1"> <tr> <td>پروژه</td> <td>بسته کاری</td> <td>صادر کننده</td> <td>تسهیلات</td> <td>رشته</td> <td>نوع مدرک</td> <td>سریال</td> <td>نسخه</td> </tr> <tr> <td>BK</td> <td>GCS</td> <td>HY</td> <td>120</td> <td>ME</td> <td>DS</td> <td>0001</td> <td>V03</td> </tr> </table>	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	BK	GCS	HY	120	ME	DS	0001	V03	شماره صفحه : 12 از 24																																																																																																																																																																																																																																																																															
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1 2 SERVICE/ITEM NO. 3 STAGE 4 INLET PRESSURE, barg 5 DISCHARGE PRESSURE, barg 6 CYLINDERS PER STAGE 7 SINGLE OR DOUBLE ACTING (SA OR DA) 8 BORE, mm 9 STROKE, mm 10 RPM: RATED / MAX ALLOW 11 PISTON SPEED, m/s: RATED / MAX ALLOW 12 CYLINDER LINER, YES/NO 13 LINER NOMINAL THICKNESS, mm 14 PISTON DISPLACEMENT, m³/h 15 CYLINDER DESIGN CLEARANCE, % AVERAGE 16 VOLUMETRIC EFFICIENCY, % AVERAGE 17 VALVES, INLET/DISCHARGE, QTY PER CYL. 18 TYPE OF VALVES 19 VALVE LIFT, INLET/DISCHARGE, mm 20 VALVE VELOCITY, m/s 21 SUCTION VALVE(S) 22 DISCHARGE VALVE(S) 23 ROD DIAMETER, mm 24 MAX ALLOW. COMBINED ROD LOADING, kN, C * 25 MAX ALLOW. COMBINED ROD LOADING, kN, T * 26 CALCULATED GAS ROD LOAD, kN, C * 27 CALCULATED GAS ROD LOAD, kN, T * 28 COMBINED ROD LOAD (GAS + INERTIA), kN, C * 29 COMBINED ROD LOAD (GAS + INERTIA), kN, T * 30 ROD REV., DEGREES MIN @ X-HD PIN** 31 RECIP WT. (PISTON, ROD, X-HD & NUTS), kg** 32 MAX ALLOW. WORKING PRESSURE, barg 33 MAX ALLOW. WORKING TEMPERATURE, °C 34 HYDROSTATIC TEST PRESSURE, barg 35 GAS LEAKAGE TEST PRESSURE, barg 36 INLET FLANGE SIZE/RATING 37 FACING 38 DISCHARGE FLANGE SIZE/RATING 39 FACING 40 DISCHARGE RELIEF VALVE SETTING DATA AT INLET PRESSURES GIVEN ABOVE: 41 RECOMMENDED SETTING, barg 42 GAS ROD LOAD, kN, C * 43 GAS ROD LOAD, kN, T * 44 COMBINED ROD LOAD, kN, C * 45 COMBINED ROD LOAD, kN, T * 46 ROD REVERSAL, °MIN @ X-HD PIN** 47 NOTE: CALCULATED AT INLET PRESSURES 48 GIVEN ABOVE & RECOMMENDED SETTING. 49 ● SETTLE-OUT GAS PRESSURE 50 (DATA REQUIRED FOR STARTING) 51 NOTES/REMARKS:	☒ CYLINDER DATA AT FULL LOAD CONDITION <table border="1"> <tr> <th colspan="2">Sour Gas</th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <th>1st</th> <th>2nd</th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <td>4.90</td> <td>16.956</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>17.856</td> <td>54.80</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>1</td> <td></td> <td></td> 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شماره پیمان: 053 - 073 - 9184		DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES							شماره صفحه : 13 از 24			
		BK	GCS	HY	120	ME	DS	0001	V03			
		CONSTRUCTION FEATURES										
1												
2	SERVICE ITEM NO.	Sour Gas										
3	STAGE	2										
4	CYLINDER SIZE (BORE DIA), mm	475 / 280										
5	ROD RUN-OUT: NORMAL COLD VERTICAL (per Annex C)											
6												
7	CYLINDER INDICATOR VALVES REQUIRED	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
8	INDICATOR CONNECTIONS ABOVE 345 bar	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
9	FLUOROCARBON SPRAYED CYLINDER	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
MATERIALS OF CONSTRUCTION												
10	CYLINDER(S)	A395 Gr. 60-40-18										
11	CYLINDER LINER(S)	A278 CL.NO.40										
12	PISTON(S)	A395 Gr. 60-40-18										
13	PISTON RINGS	Filled PTFE										
14	WEAR BANDS ☒ REQUIRED	Filled PTFE										
15	PISTON ROD(S): MATERIAL/YIELD, N/mm ²	A564 Type 630 / / / / / /										
16	THREAD ROOT STRESS @ MACRL * @ X-HD END	-										
17	PISTON ROD HARDNESS, BASE MATERIAL, Rc	Min HRc 28										
18	PISTON ROD COATING ☒ REQUIRED	"Tc" Coating										
19	COATING HARDNESS, Rc	50 AS MIN. AT PACKING TRAVEL AREA (TUNGSTEN CARBIDE)										
20	VALVE SEATS / SEAT PLATE	A276 Type 420										
21	VALVE SEAT MIN HARDNESS, Rc	HRc 18~22										
22	VALVE GUARDS (STOPS)	A276 Type 420										
23	VALVE DISCS	PEEK (Non-Metallic)										
24	VALVE SPRINGS	B637 (Inconel X-750)										
25	ROD PRESSURE PACKING RINGS	Filled PTFE										
26	ROD PRESSURE PACKING CASE	A276 TP316L										
27	ROD PRESSURE PACKING SPRINGS	B637 (Inconel X-750)										
28	SEAL / BUFFER PACKING, DISTANCE PIECE	Filled PTFE										
29	SEAL / BUFFER PACKING, INTERMEDIATE	Filled PTFE										
30	WIPER PACKING RINGS	ASTM B23 NO.1										
31	MAIN JOURNAL BEARINGS, CRANKSHAFT	ASTM A53 Gr.A (ASTM B23 WM2 Coating)										
32	CONNECTING ROD BEARING, CRANKPIN	ASTM A53 Gr.A (ASTM B23 WM2 Coating)										
33	CONNECTING ROD BUSHING, X-HD END	ASTM A53 Gr.A (ASTM B584 C93700 Coating)										
34	CROSSHEAD (X-HD) PIN BUSHING	ASTM A53 Gr.A (ASTM B584 C93700 Coating)										
35	CROSSHEAD PIN	ASTM A534 NO. B25 Equiv. (Cr-Mo Alloy Steel)										
36	CROSSHEAD	ASTM A216 Gr.WCB										
37	CROSSHEAD SHOES	ASTM A278CL.NO.35 "Wj2"Coating										
38	MAR.2025 COLD SIDE	N/A										
39	CONTACT W/PROCESS GAS HOT SIDE	N/A										
40	* MACRL = MAXIMUM ALLOWABLE COMBINED ROD LOAD											
41	☒ COMPRESSOR CYLINDER ROD PACKING					DISTANCE PIECE(S): ☐ TYPE A ☐ TYPE B ☒ TYPE C ☐ TYPE D						
42	☐ FULL FLOATING PACKING					REF. FIGURE G-3						
43	☒ VENTED TO: ☒ FLARE @ _____ barg ☐ ATMOS.					COVERS: ☒ SOLID METAL ☐ SCREEN ☐ LOUVERED						
44	☐ SUCTION PRESSURE @ 0.8 barg					CYLINDER COMPARTMENT: ☒ VENTED TO Flare @ 0.8 barg						
45	☒ FORCED LUBRICATED ☐ NON-LUBE					☒ PURGED AT 1.8 barg						
46	☒ WATER COOLED, _____ STAGE(S), _____ GPM REQ'D					☐ PRESSURIZED TO _____ barg						
47	☒ OIL COOLED, _____ STAGE(S), _____ GPM REQ'D					☐ WITH RELIEF VALVE						
48	☒ WATER FILTER ☐ PROV.FUTURE WATER/OIL COOLING					☒ VENTED TO ATM barg						
49	☐ VENT/BUFFER GAS SEAL PACKING ARR. (REF. FIG I-1)					☒ PURGED AT 0.5 ~ 1 barg						
50	☒ CONSTANT OR ☐ VARIABLE DISPOSAL SYSTEM					☐ PRESSURIZED TO _____ barg						
51	☐ BUFFER GAS PRESSURE, 2 barg					☐ WITH RELIEF VALVE						
52	☐ SPLASH GUARDS FOR WIPER PACKING					☒ DISTANCE PIECE MAWP 2.8 barg						

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شماره پیمان: 053 - 073 - 9184		DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES		شماره صفحه: 14 از 24	
نسخه سریال نوع مدرک رشته تسهیلات صادرکننده بسته کاری پروژه		BK GCS HY 120 ME DS 0001 V03			

CONSTRUCTION FEATURES (CONTINUED)			
1 ☐ FABRICATED CYLINDER, HEADS, & CONNECTION 2 SKETCHES FOR DESIGN REVIEW 3 BY PURCHASER. (6.15.5.13)		4 ☒ BUFFER GAS PACKING ARR. REF: ANNEX I 5 ☐ OIL WIPER PACKING PURGE FIGURES I-1, I-2 & I-3 6 ☒ INTERMEDIATE PARTITION PURGE 7 INERT BUFFER PURGE GAS: ☒ N ₂ ☐ OTHER _____ 8 ☒ VENT, DRAIN, PURGE PIPING BY MFG'R ☐ NO ☒ YES	
9 ☒ COUPLING(S) ☒ LOW-SPEED ☐ HI-SPEED 10 Between Compressor & Driver or Gear Between Driver & Gear 11 ☒ BY MANUFACTURER Nara Corp. 12 ☒ MODEL NPE-B API 13 ☒ TYPE Flexible 14 API-671 APPLIES ☒ YES ☐ NO		15 ☐ V-BELT DRIVE DRIVEN SHEAVE DRIVE SHEAVE 16 (COMPRESSOR SHAFT) (DRIVER SHAFT) 17 RPM (EXPECTED) _____ 18 PITCH DIA. (IN.) _____ 19 QTY & GROOVE X-SEC. _____ 20 POWER TRANSMITT'D _____ 21 Incl. Belt Losses 22 DRIVER NAMEPLATE HP RATING _____ 23 CENTER DISTANCE (IN.) _____ 24 QTY, TYPE, _____ 25 X-SEC., & LENGTH BELTS _____ 26 BELT SERVICE FACTOR (RELATIVE TO DRIVER NAMEPLATE HP RATING) _____	
27 ☒ INSPECTION AND SHOP TESTS (REF. 8.1.5) 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55		27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55	

		نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج های کمپرسور گاز (دفت و برگشتی) بینک (قرارداد BK-HD-GCS-CO-0008_03)							
شماره پیمان: 053 - 073 - 9184		DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES					شماره صفحه : 15 از 24		
		نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
		V03	0001	DS	ME	120	HY	GCS	BK

UTILITY CONSUMPTION									
ELECTRIC MOTORS NOTE20									
FOR INDUCTION MOTORS SEE NOTE OF 7.1.2.6 AND MOTOR DATA SHEET		NAMEPLATE kW	LOCKED ROTOR AMPS	FULL LOAD STEADY STATE AMPS	MAIN DRIVER NON-STEADY STATE AMPS AT COMPRESSOR RATED HORSEPOWER (INDUCTION MOTORS ONLY)				
◆ MAIN DRIVER		1070	6In	81.7	AMPS				
◆ MAIN LUBE OIL PUMP		SHAFT DRIVEN	SHAFT DRIVEN	SHAFT DRIVEN	@ COMPRESSOR RATED				
◆ AUX LUBE OIL PUMP		5.5	6.5In	11.5	kW OF				
◆ MAIN CYLINDER COOLANT PUMP		5.5	6.5In	11.5	@ CURRENT PULSATIONS				
◆ AUX CYLINDER COOLANT PUMP		5.5	6.5In	11.5	OF %				
◇ MAIN ROD PKG COOLANT PUMP									
◇ AUX ROD PKG COOLANT PUMP									
◆ CYLINDER LUBRICATOR		0.4	6In	1					
◆ FAN MOTOR		Oil cooler 5.5Kw	7In	11.5					
◆		Water cooler 3Kw	7In						
◆ BARRING DEVICE		2.2	7In	4.8					
ELECTRIC HEATERS									
		WATTS	VOLTS	HERTZ					
◆ FRAME OIL HEATER(S)		1500	230	50					
◆ CYLINDER COOLANT HEATER(S)		13500	400	50					
◆ CYL. LUBRICATOR HEATER(S)		500	230	50					
◇ MAIN DRIVER SPACE HEATER(S)									
STEAM									
	FLOW	PRESSURE	TEMPERATURE	BACK PRESSURE					
◇ MAIN DRIVER	kg/h @	barg	°CTT TO	barg					
◇ FRAME OIL HEATER(S)	kg/h @	barg	°CTT TO	barg					
◇ CYL. LUB. HEATER(S)	kg/h @	barg	°CTT TO	barg					
	kg/h @	barg	°CTT TO	barg					
	kg/h @	barg	°CTT TO	barg					
COOLING WATER REQUIREMENTS									
	FLOW m ³ /h	INLET TEMP °C	OUTLET TEMP °C	INLET PRESS barg	OUTLET PRESS barg	MAX PRESS barg			
◆ CYLINDER JACKETS	14.9	63	70	3					
◇ CYLINDER COOLANT CONSOLE									
◇ FRAME LUBE OIL COOLER									
◇ ROD PRESSURE PACKING*									
◆ PACKING COOLANT CONSOLE (NOTE 1)	0.4	63	70	3					
◇ INTERCOOLER(S)									
◇ AFTERCOOLER									
◆ TOTAL QUANTITY, m ³ /h	15.3								
REMARKS/SPECIAL REQUIREMENTS:									
*ROD PACKING COOLANT MAY BE OTHER THAN WATER									

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج های کمپرسور گاز (دفت و برگشتی) بینک (BK-HD-GCS-CO-0008_03 قرارداد)																																											
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1 ☐ FRAME LUBE OIL SYSTEM	2 ☐ BASIC LUBE OIL SYSTEM FOR FRAME: ☐ SPLASH ☐ PRESSURE (FORCED) ☐ HEATERS REQUIRED: 3 ☐ REF: TYPE MAIN BEARINGS: ☐ TAP'RD ROLL'R ☐ PRECISION SL'VE ☐ ELEC. W/THERMOSTAT(S) ☐ STEAM 4 ☐ PRESSURE SYSTEM: ☐ MAIN OIL PUMP DRIVEN BY: ☐ COMP. CRANKSHAFT ☐ ELEC. MOTOR ☐ OTHER _____ 5 ☐ PSV FOR MAIN PUMP EXTERNAL TO CRANKCASE ☐ CHECK VALVE ON MAIN PUMP (FIG G-5) 6 ☐ AUX OIL PUMP DRIVEN BY: ☐ ELEC. MOTOR ☐ OTHER _____ 7 ☐ HAND OPERATED PRE-LUBE PUMP FOR STARTING ☐ OPERATIONAL TEST & 4 HOUR MECH RUN TEST 8 ☐ CONTINUOUS OIL FLOW THROUGH SWITCH SENSING LINE (7.7.2.5) 9 ☐ SEP. CONSOLE FOR PRESS. LUBE SYS: ☐ ONE CONSOLE FOR EA. COMP. ☐ ONE CONSOLE FOR _____ COMPRESSORS 10 Note: Instrumentation to be listed on _____ 11 Note: Instrumentation to be listed on _____ 12 ☐ ELECTRICAL CLASSIFICATION : (ZONE 2 GROUP IIB TEMP CLASS T4 ☐ NON-HAZARDOUS																																											
13 ☐ BASIC SYS. REQ'MTS (NORM. OIL FLOWS & VOLUMES)	<table border="1"> <thead> <tr> <th>LUBE OIL</th> <th>FLOW lit/min</th> <th>PRESSURE barg</th> <th>VISCOSITY SSU @ 40°C</th> <th>VISCOSITY SSU @ 100°C</th> <th>SUMP VOLUME m³</th> </tr> </thead> <tbody> <tr> <td>COMPRESSOR FRAME</td> <td>131</td> <td>5</td> <td></td> <td></td> <td>0.35</td> </tr> <tr> <td>DRIVER</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GEAR</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> 19 ☐ SYSTEM PRESSURES: ☐ DESIGN 8 barg ☐ HYDROTEST AS PER CODE barg 20 ☐ PRESSURE CONTROL VALVE SETTING 6 barg ☐ PUMP REL'F VALVE(S) SET 7.5 barg		LUBE OIL	FLOW lit/min	PRESSURE barg	VISCOSITY SSU @ 40°C	VISCOSITY SSU @ 100°C	SUMP VOLUME m ³	COMPRESSOR FRAME	131	5			0.35	DRIVER						GEAR																							
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36 ☐ COOLERS: ☐ SHELL & TUBE ☐ SINGLE ☐ DUAL W/TRANSFER VALVE ☐ MFG'S STD. ☐ TEMA C ☐ TEMA R (API 660)	37 ☐ REMOVABLE BUNDLE ☐ WATER COOLED ☐ AIR COOLED (API-661) 38 ☐ W/BYPASS & TEMP CONTROL VALVE: ☐ MANUAL ☐ AUTO 39 ☐ SEE SEPARATE HEAT EXCHANGER DATA SHEETS FOR DETAILS, SPECIFY % GLYCOL ON COOLING WATER SIDE																																											
40 ☐ FILTER(S) ☐ SINGLE ☐ DUAL W/TRANSFER VALVE ☐ ASME CODE DESIGN ☐ ASME CODE STAMPED	41 ☐ DESIGN PRESSURE, _____ barg ☐ Δ P CLEAN, _____ barg ☐ Δ P COLLAPSE, _____ barg 42 ☐ MICRON RATING, _____ ☐ CARTRIDGE MATERIAL, _____ ☐ CARTRIDGE P/N _____ 43 ☐ BONNET MATERIAL, _____ ☐ CASING MATERIAL, SS 316 ☐ FURN.SPARE CARTR.,QTY 2																																											
44 ☐ SYS. COMPONENT SUPP.	<table border="1"> <thead> <tr> <th></th> <th>MANUFACTURER</th> <th>MODEL</th> <th></th> <th>MANUFACTURER</th> <th>MODEL</th> </tr> </thead> <tbody> <tr> <td>☐ MAIN PUMP</td> <td>KwangShin</td> <td>50F - 108 - 70</td> <td>☐ OIL COOLER(S)</td> <td>Mechanic Sayyalat</td> <td></td> </tr> <tr> <td>☐ AUXILIARY PUMP</td> <td>Kracht</td> <td>KF 3 / 100</td> <td>☐ TRANSFER VALVE(S)</td> <td>As per sub vendor list</td> <td></td> </tr> <tr> <td>☐ MECHANICAL SEALS</td> <td></td> <td></td> <td>☐ PUMP COUPLING(S)</td> <td>As per sub vendor list</td> <td></td> </tr> <tr> <td>☐ ELECTRIC MOTORS</td> <td>Jemco</td> <td></td> <td>☐ SUCTION STRAINER(S)</td> <td>As per sub vendor list</td> <td></td> </tr> <tr> <td>☐ STEAM TURBINES</td> <td></td> <td></td> <td>☐ CHECK VALVE(S)</td> <td>As per sub vendor list</td> <td></td> </tr> <tr> <td>☐ OIL FILTER(S)</td> <td>Filtrec</td> <td></td> <td>☐</td> <td></td> <td></td> </tr> </tbody> </table>			MANUFACTURER	MODEL		MANUFACTURER	MODEL	☐ MAIN PUMP	KwangShin	50F - 108 - 70	☐ OIL COOLER(S)	Mechanic Sayyalat		☐ AUXILIARY PUMP	Kracht	KF 3 / 100	☐ TRANSFER VALVE(S)	As per sub vendor list		☐ MECHANICAL SEALS			☐ PUMP COUPLING(S)	As per sub vendor list		☐ ELECTRIC MOTORS	Jemco		☐ SUCTION STRAINER(S)	As per sub vendor list		☐ STEAM TURBINES			☐ CHECK VALVE(S)	As per sub vendor list		☐ OIL FILTER(S)	Filtrec		☐		
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COOLANT SYSTEM

BASIC COOLING SYS. FOR:

COMPRESSOR CYL(S) **ROD PACKING(S)** **PROCESS COOLER(S)** **OIL COOLER(S)**

HEATERS REQ'D FOR PRE-HEATING: **ELEC. W/ THERMOSTAT(S)** **STEAM**

PRESSURE FORCED CIRCULATING SYS: **OPEN, PIPING BY:** **PURCH.** **MFR** **CLOSED, PIPING BY MFR.**

MAIN COOLANT PUMP DRIVEN BY: **ELEC. MOTOR** **STEAM TURBINE** **OTHER**

AUX COOLANT PUMP DRIVEN BY: **ELEC. MOTOR** **STEAM TURBINE** **OTHER**

SEP. CONSOLE FOR COOLANT SYSTEM: **ONE CONSOLE FOR EA. COMP.** **ONE CONSOLE FOR** **COMPR'S**

NOTE: Instrumentation to be listed on instrumentation data sheets. **CONSOLE TO BE OF DECK PLATE TYPE CONSTRUCTION SUITABLE FOR MULTI-POINT SUPPORT AND GROUTING WITH GROUT & VENT HOLES.**

ELECTRICAL CLASSIFICATION : C ZONE 2 GROUP IIB TEMP CLASS T4 **NON-HAZARDOUS**

BASIC SYS. REQ'MTS (NORM. COOLANT FLOW DATA) **COOLANT TO BE** 50 % ETHYLENE GLYCOL **SITE**

	FORCED COOL'G	THERMO SYPHON	STAND PIPE	FLOW m ³ /h	PRESSURE barg	INLET TEMP °C	OUTLET TEMP °C	FLOW IND'TR
CYLINDER(S), 1st STAGE	●	○	○	14.9	3	63	70	●
CYLINDER(S), 2nd STAGE	●	○	○		3	63	70	●
CYLINDER(S), STAGE	○	○	○					○
CYLINDER(S), STAGE	○	○	○					○
CYLINDER(S), STAGE	○	○	○					○
CYLINDER(S), STAGE	○	○	○					○
PISTON ROD PACK'G TOTAL	●			0.4	3	63	70	●
INTERCOOLER(S) TOTAL	○							○
AFTERCOOLER	○							○
OIL COOLER(S)	○							○
TOTAL FLOW				15.3				

SYS. PRESSURES: **DESIGN,** 5 barg **HYDROTEST,** 7.5 barg **RELIEF VALVE(S), SETTING** barg

COOLANT RESERVOIR: **SIZE,** 1300 mm IN DIA X 2250 mm IN HT. **CAPACITY** 2.7 m³

@ NORMAL OPERATING LEVEL

RESERVOIR MATERIAL **INTERNAL COATING, TYPE** Carbon Steel / Epoxy Paint

PUMPS: (CENTRIFUGAL ONLY) **RAT'D FL'W** **PRESS.** **REQ'D** **DRIVER** **SPEED** **COUPLING** **MECH. SEAL**

	m ³ /h	barg	kW	kW	r/min	REQ'D	REQ'D
MAIN	15.3	4	3.8	5.5	1445	●	○
AUXILIARY	15.3	4	3.8	5.5	1445	●	○

PUMP CASING MATERIAL (Ref 6.14.2.1.5): **MAIN PUMP** Cast Stainless Steel (1.4408) **AUX PUMP** Cast Stainless Steel (1.4408)

GUARD(S) REQ'D FOR COUP'G(S) **MAIN PUMP** **AUX PUMP** **GUARD TYPE OR CODE** Non Sparking

AUX. PUMP CONTROL: **MANUAL** **AUTO** **ON-OFF-AUTO SEL. SWITCH:** **BY PURCH.** **BY MANUFACTURER**

WIRING TO TERMINAL BOX: **BY PURCH.** **BY MANUFACTURER**

COOLANT HEAT EXCHANGER: **SHELL & TUBE** **SINGLE** **DUAL W/TRANSFER VALVE** **TEMA C** **TEMA R (API 660)**

(DATA SHEETS ATTACHED)

AIR COOLED EXCHANGER

W/BYPASS & TEM. CONTROL VALVE **MANUAL** **AUTO** **LOUVERS FOR AIR EXCH.**

SEE SEPARATE COOLER DATA SHEET FOR DETAILS; SPECIFY % GLYCOL ON BOTH SIDES OF SHELL & TUBE

SYS. COMPONENT SUPP.	MANUFACTURER	MODEL	MANUFACTURER	MODEL
MAIN PUMP	KSB	CPK 40 200	TEMP CONTROL VALVE(S)	as per sub vendor list
AUXILIARY PUMP	KSB	CPK 40 200	TRANSFER VALVE(S)	as per sub vendor list
MECHANICAL SEALS	Burgmann	M7N	PUMP COUPLING(S)	as per sub vendor list
ELECTRIC MOTORS	Jemco		WATER COOLER(S)	Mechanic Sayyalat
STEAM TURBINES				

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PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS THESE SHEETS TO BE FILLED OUT FOR EACH SERVICE AND/OR STAGE OF COMPRESSION																		
3 APPLICABLE TO: ☐ PROPOSALS ☒ PURCHASE ☐ AS BUILT 4 FOR/USER National Iranian South Oil Company (NISOC) 5 SITE/LOCATION Binak Oil Field AMBIENT TEMPERATURE MIN/MAX 5 / 55 °C 6 COMPRESSOR SERVICE Sour Gas NUMBER OF COMPRESSORS 3 7 COMPRESSOR MFG. Havayar / Kwangshin MODEL/TYPE KSOPT 8 SUPPRESSOR MFG. AVL 9 NOTE: ☐ Ind.Data Comp.'d Purch. ☐ By Compr/Supp.Mfg.w/Proposal ☒ By Mfg(s) after order ☐ By Mfg(s)/Purchaser as Applicable																		
GENERAL INFORMATION APPLICABLE TO ALL SUPPRESSORS																		
11 TOTAL NUMBER OF SERVICES AND/OR STAGES 2 12 TOTAL NUMBER OF COMPRESSOR CYL. 2 TOTAL NUMBER OF CRANKTHROWS 2 STROKE 250 r/min 420 13 ☐ ASME CODE STAMP ☐ GOVERNMENTAL CODES OF ASME sec. VIII Div.1 CODE REGULATIONS APPLY 14 ☒ OTHER APPLICABLE PRESSURE VESSEL SPEC. OR CODE 15 ☒ LUBE SERVICE ☐ NON-LUBE SERV. ☐ NO OIL ALLOWED INTERNALLY DRY TYPE INTER.CORR.COATING ☐ YES ☐ NO 16 RADIOGRAPHY (X-RAY OF WELDS): ☐ NONE ☐ SPOT ☒ 100% ☐ IMPACT TEST ☐ SPECIAL WELDING REQUIREMENTS 17 ☒ SHOP INSPECTION ☒ WITNESS HYDROTEST ☒ OUTDOOR STORAGE OVER 6 MONTHS ☒ SPECIAL PAINT SPEC 18 ☐ WITNESSED ☐ OBSERVED																		
CYLINDER, GAS, OPERATING, AND SUPPRESSOR DESIGN DATA																		
21 SERVICE Wet HC gas STAGE NO. 1st / 2nd																		
22 COMPRESSOR MANUFACTURER'S RATED CAPACITY Kg/h 8935.5 m3/h 1589 Nm3/h 8162.9																		
23 ☒ LINE SIDE OPERATING PRESSURE INLET, 4.81 / 17.96 bar DISCHARGE 16.86 / 54.90 bar 24 ☒ OPERATING TEMP. WITHIN SUPPRESSORS INLET, 19~36.8 / 59.9 °C DISCHARGE 129 / 149 °C 25 ☒ ALLOWABLE PRESSURE DROP THROUGH SUPPRESSORS Δ P 68 / 65 mbar / 1.16 / 1.12 % Δ P 223/215 mbar / 1.16 / 1.12 %																		
26 INLET SUPPRESSOR DISCHARGE SUPPRESSOR 27 C-2101-D1 / C-2102-D1 C-2101-D2 / C-2102-D2 28 ☐ YES ☒ NO / ☐ YES ☒ NO / ☐ YES ☒ NO 29 ☒ NO. (QTY) OF INLET & DISCH. SUPP. PER STAGE 1 / 1 1 / 1 30 ALLOWABLE PEAK-PEAK PULSE @ LINE SIDE NOZZLE bar / % bar / % 31 ALLOWABLE PEAK-PEAK PULSE @ CYL FLANGE NOZZLE bar / % bar / % 32 33 ☒ DESIGN FOR FULL VACUUM CAPABILITY ☐ YES ☒ NO ☐ YES ☒ NO 34 ☐ MIN. REQ'D WORKING PRESSURE & TEMPERATURE 35 NOTE: After design, the actual MAWP & temp are to be determined based on the weakest component and stamped on the vessel. The actual MAWP is to be shown on pg.14 line 12 and on the U1A Forms. 36 barg, @ °C barg, @ °C 37 38 39 ☒ INITIAL SIZING VOL. PER FORMULA OF 7.9.3.2 40 NOTE: This is a Reference 1.438 / 0.5 m³ 0.911 / 0.339 m³ 41 42 ☒ AS BUILT VOLUME (m³) m³ m³																		

 NISOC		نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج های کمپرسور گاز (دفت و برگشتی) بینک (قرارداد BK-HD-GCS-CO-0008_03)				 HAVAYAR INDUSTRIAL GROUP			
شماره پیمان: 053 - 073 - 9184		DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES						شماره صفحه : 19 از 24	
		نسخه سریال نوع مدرک رشته تسهیلات صادر کننده بسته کاری پروژه							
		BK GCS HY 120 ME DS 0001 V03							
1		PULSATION SUPPRESSION DEVICES FOR RECIPROCATING COMPRESSORS (CONT'D)						SERVICE Sour Gas	
2		THESE SHEETS TO BE FILLED OUT FOR EACH SERVICE AND/OR STAGE OF COMPRESSION						STAGE NO. 1st / 2nd	
3		CONSTRUCTION REQUIREMENTS & DATA				INLET SUPPRESSOR		DISCHARGE SUPPRESSOR	
4		● SUPPRESSOR TAG NUMBER				C-2101-D1 / C-2102-D1		C-2101-D2 / C-2102-D2	
5		● BASIC MATERIAL REQUIRED, CS, SS, ETC.				Carbon Steel (NOTE13)		Carbon Steel (NOTE 13)	
6		◆ ACTUAL MATERIAL DESIGNATION SHELL/HEAD				SA 516 Gr70N NACE / SA 516 Gr70N NACE		SA 516 Gr70N NACE / SA 516 Gr70N NACE	
7		○ SPECIAL HARDNESS LIMITATIONS, Rc ● YES ○ NO				SHELL & HEADS WELDS		SHELL & HEADS WELDS	
8		■ CORROSION ALLOWANCE., mm ● REQUIRED				3 mm		3 mm	
9		◆ WALL THICKNESS, mm SHELL/HEAD				15 / 25 mm/ min: 12 / 21 mm		15 / 25 mm/ min: 12 / 21 mm	
10		■ NOM. SHELL DIA X OVERALL LGTH. (INCH/VOL.mm³)				864 / 711 mm/ 1.36 / 0.66 mm³		813 / 711 mm/ 1.10 / 0.64 mm³	
11		■ PIPE OR ROLLED PLATE CONSTRUCTION				□ PIPE ■ ROLLED PLATE		□ PIPE ■ ROLLED PLATE	
12		◆ ACT. MAX ALLOW. WORKING PRESS. AND TEMPERATURE				24.5 / 62 bar @ 180 °C		24.5 / 62 bar @ 180 °C	
13		● MINIMUM DESIGN METAL TEMP (6.15.8.1)				-26 °C		-26 °C	
14		● INLET SUPPRESS. TO BE SAME MAWP AS DISCH'RG SUPPRESS.				● YES ○ NO			
15		◇ MAX EXPECTED PRESSURE DROP(Δ P, %) LINE PRESS				Δ P bar/ %		Δ P bar/ %	
16		◇ WEIGHT (kg EACH)				1337.2 / 1368.6 kg		1277.8 / 1424 kg	
17		○ INSUL NUTS & ALLOW. FOR INSULATION REQUIRED (X)							
18		◇ EXPECTED P-P PULSE @ LINE SIDE/CYL FLG, % LINE PRESS BASED ON FINAL SUPPRESSOR DESIGN				%/ %		%/ %	
19									
20		☐ SUPPORTS, TYPE/QUANTITY							
21		CONNECTION REQUIREMENTS & DATA							
22		● LINE SIDE FLANGE. SIZE/RATING/FACING/TYPE				10" 300lb RF / Single 6" 600lb RF		10" 300lb RF / Single 6" 600lb RF	
23		● COMP CYL FLANGE(S), QTY/SIZE/RATING/FACING/TYPE				Single 10" 300lb FF / Single 6" 600lb FF		Single 10" 300lb FF / Single 6" 600lb FF	
24		● FLANGE FINISH, ○ PER 7.9.5.1.16 ○ SPECIAL (SPECIFY)							
25		>125 <250 ● PER ANSI 16.5							
26		● INSPECTION OPENINGS REQUIRED				● YES ○ NO ● BLINDED		● YES ○ NO ● BLINDED	
27		○ SPEC. QTY. SIZE, /FLG TYPE & RATING							
28		◇ * QTY. SIZE, /FLG TYPE & RATING							
29		● VENT CONNECTIONS REQUIRED				● YES ○ NO		● YES ○ NO	
30		○ SPEC. QTY. SIZE, /FLG TYPE & RATING							
31		◇ * QTY. SIZE, /FLG TYPE & RATING							
32		● DRAIN CONNECTIONS REQUIRED				● YES ○ NO		● YES ○ NO	
33		○ SPEC. QTY. SIZE, /FLG TYPE & RATING							
34		◇ * QTY. SIZE, /FLG TYPE & RATING							
35		● PRESSURE CONNECTIONS REQUIRED				● YES ○ NO		● YES ○ NO	
36		○ SPEC. QTY. SIZE, /FLG TYPE & RATING							
37		◇ * QTY. SIZE, /FLG TYPE & RATING							
38		● TEMPERATURE CONNECTIONS REQUIRED				● YES ○ NO		● YES ○ NO	
39		○ SPEC. QTY. SIZE, /FLG TYPE & RATING							
40		○ CYL NOZZLE ○ MAIN BODY							
41		◇ * QTY. SIZE, /FLG TYPE & RATING							
42									
43									
44									
45									
46		OTHER DATA AND NOTES							
47		◆ COMPRESSOR MFG'S SUPP. OUTLINE OR DRAWING NO.				BK-GCS-HY-120-ME-DW-0032		BK-GCS-HY-120-ME-DW-0032	
48		◇ SUPP. MFG'S OUTLINE OR DRAWING NO.							
49		NOTES * = AS BUILT							
50									
51									

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NISOC

نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض و ابنیه تحت الارض

خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک
(قرارداد BK-HD-GCS-CO-0008_03)



HAVAYAR
INDUSTRIAL GROUP

شماره پیمان:

053 - 073 - 9184

DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادر کننده	بسته کاری	پروژه
V03	0001	DS	ME	120	HY	GCS	BK

شماره صفحه : 21 از 24

INSTRUMENTATION (CONT'D)

TEMPERATURE MEASUREMENT REQUIREMENTS

FUNCTION	LOCALLY MOUNTED	PANEL MOUNTED	GAUGE W/ CAPILLARY	THERMO CPL SYS	RTD SYS	I/S SYS
LUBE OIL ● INLET TO ○ OUT OF FRAME	(■ ○ ○)	(□ ○ ○)	○	○	○	○
LUBE OIL ● INLET TO ● OUT OF COOLER	(■ ○ ○)	(□ ○ ○)	○	○	○	○
MAIN JRNL BEARINGS (THERMOCOUPLES OR RTD'S ONLY)	(■ ○ ○)	(□ ○ ○)	○	○	●	○
MOTOR BEARING(S) (THERMOCOUPLES OR RTD'S ONLY)	(■ ○ ○)	(□ ○ ○)	○	○	●	○
CYL. COOLANT MANIFOLD: ● INLET ○ OUTLET	(■ ○ ○)	(□ ○ ○)	○	○	○	○
CYL. JKT. COOLANT: ○ INLET ● OUTLET ● EA. CYL	(■ ○ ○)	(□ ○ ○)	○	○	○	○
PROCESS GAS: ● INLET ● DISCH. ● EACH CYL	(■ ○ ○)	(□ ○ ○)	○	○	○	○
INTERCOOLER(S) ● INLET ● GAS ○ COOLANT	(□ ● ○)	(□ ○ ○)	○	○	○	○
● OUTLET ● GAS ○ COOLANT	(□ ○ ○)	(□ ○ ○)	○	○	○	○
AFTERCOOLER: ● INLET ● GAS ○ COOLANT	(□ ● ○)	(□ ○ ○)	○	○	○	○
● OUTLET ● GAS ○ COOLANT	(□ ● ○)	(□ ○ ○)	○	○	○	○
PKG COOLANT ○ INLET ● OUTLET	(■ ○ ○)	(□ ○ ○)	○	○	○	○
PRESS. PGK CASE, CYL PIST ROD (THRM/CPLS OR RTD'S ONLY)	(■ ○ ○)	(□ ○ ○)		○	●	○
COMPRESSOR VALVES ○ SUCT. ○ DISCH. TC'S OR RTD'S ONLY	(□ ○ ○)	(□ ○ ○)	○	○	○	○
all alarm and shut down are according to Approved PID	(□ ○ ○)	(□ ○ ○)	○	○	○	○

ALARM & SHUTDOWN SYSTEM REQ'MTS

NOTE: ALARM & SHUTDOWN DEVICES SHALL BE INDIVIDUALLY SEPARATE

FUNCTION	ALARM	SHUT DOWN	ANNUNCIATION POINTS				TOTAL NO. OF POINTS
			ALARM		SHUTDOWN		
			IN PNL BY MFR	IN CTL ROOM PNL OTH'RS	IN PNL BY MFR	IN CTL ROOM PNL OTH'RS	
LOW LUBE OIL PRESS. @ BEARING HEADER	(■ ○ ○)	(■ ○ ○)	●	●	●	●	Later
HIGH LUBE OIL Δ P ACR P ACROSS FILTER	(■ ○ ○)	(□ ○ ○)	●	●	○	○	Later
LOW LUBE OIL LEVEL, FRAME	(■ ○ ○)	(□ ○ ○)	●	●	○	○	
AUX LUBE OIL PUMP, FAIL TO START	(■ ○ ○)	(□ ○ ○)	●	●	○	○	
CYL LUBE SYSTEM PROTECTION	(■ ○ ○)	(□ ○ ○)	●	●	○	○	Later
COMPR. VIBRATION, SHUTDOWN ONLY		(□ ○ ○)	○	○	○	○	
VIBRATION, W/ CONTINUOUS MONITORING	(■ ○ ○)	(■ ○ ○)	●	●	○	○	Later
ROD DROP DETECTOR, CONTACT TYPE(1/CYL)	(□ ○ ○)	(□ ○ ○)	○	○	○	○	
ROD DROP PROXIMITY PROBE (1/CYL)	(■ ○ ○)	(□ ○ ○)	●	●	○	○	Later
OIL TEMP OUT OF FRAME	(□ ○ ○)	(□ ○ ○)	○	○	○	○	Later
HIGH GAS DISCH. TEMP EACH CYLINDER	(■ ○ ○)	(■ ○ ○)	●	●	●	●	Later
HIGH JACKET COOLANT TEMP., EA. CYL	(□ ○ ○)	(□ ○ ○)	○	○	○	○	
LOW SUCTION PRESS., FIRST STG INLET	(□ ○ ○)	(□ ○ ○)	○	○	○	○	Later
HI DISCH. PRESS. ● FINAL ○ EA STG	(■ ○ ○)	(■ ○ ○)	●	●	●	●	Later
HI CYL. GAS Δ P, EACH STAGE	(□ ○ ○)	(□ ○ ○)	○	○	○	○	
HI LIQ. LEV., EA. MOISTURE SEPARATOR	(□ ● ○)	(□ ● ○)	●	●	○	●	Later
LOW PURGE GAS PRESS, DISTANCE PIECE(S)	(■ ○ ○)	(□ ○ ○)	●	●	○	○	Later
HI X-HD PIN TEMP	(□ ○ ○)	(□ ○ ○)	○	○	○	○	
PRESS PKG CASE (PISTON ROD TEMP)	(■ ○ ○)	(■ ○ ○)	●	●	●	●	Later
all alarm and shut down are according to Approved PID	(□ ○ ○)	(□ ○ ○)	○	○	○	○	

TOTAL NUMBER OF ANNUNCIATION POINTS

SWITCH CONTACT OPERATION

NOTE: EACH SWITCH SHALL BE MINIMUM SPDT ARRANGEMENT

ALARM CONTACTS SHALL:

- OPEN (DE-ENER.) TO SOUND ALARM & BE ENERGIZED WHEN COMPR. IS IN OPERATION
- CLOSE (ENERGIZE) TO SOUND ALARM & BE DE-ENERGIZED WHEN COMPR. IS IN OPERATION

SHUTDOWN CONTACTS SHALL:

- OPEN (DE-ENERGIZED) TO SHUTDOWN & BE ENERGIZE WHEN COMPR. IS IN OPERATION
- CLOSE (ENERGIZE) TO SHUTDOWN & BE DE-ENERGIZE WHEN COMPR. IS IN OPERATION

REF: 7.6.6.2 FOR MINIMUM RECOMMENDED PROTECTION REQUIREMENTS

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک (قرارداد BK-HD-GCS-CO-0008_03)																																																																				
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 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک (قرارداد BK-HD-GCS-CO-0008_03)	 HAVAYAR INDUSTRIAL GROUP							
شماره پیمان: 053 - 073 – 9184	DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES							شماره صفحه : 23 از 24	
	نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری		پروژه
	V03	0001	DS	ME	120	HY	GCS		BK

NOTES

1	1	Train 1 is including one "two stages compressor" , C 2101 A as stage 1, C 2102 A as stage 2.	Rev
2		Train 2 is including one "two stages compressor" , C 2101 B as stage 1, C 2102 B as stage 2.	
3		Train 3 is including one "two stages compressor" , C 2101 C as stage 1, C 2102 C as stage 2.	
4		2 trains as operating+1 train as stand-by	
5			
6	2	Design Data:	
7		1st stage2nd stage	
8		Discharge Design Temperature (°c)180180	
9		Discharge Design Pressure (barg)24.562	
10			
11	3	In Utility Condition Section, Power Factor and Efficiency at 25%, 50%, 75% and 100% of Load Values will be specified	
12			
13	4	In Space Heater, Frame Lube Oil System and Coolant System Sections, If Lube Oil System is done by Electric motor,	
14			
15	5	Inlet gas are in saturated condition	
16			
17	6	Refer to hazardous area classification layout, instrumentation devices shall be suitable for Zone 2 , Gas Group IIB ,	
18		Temperature Class T4, and electrical devices shall be suitable for Zone 2, Gas Group IIB, Temperature Class T3, IP 65	
19			
20	7	The control type of compressor is C. High available system with redundant CPU and power supply to be considered for UCP.	
21		One dedicatedUCP for each train to be provided	
22			
23	8	Three Spill Back Valves to be supplied by Vendor. (Location as per P&ID)	
24			
25	9	Discharge of each stage is protected from overpressure through PSV set at design pressure, PSVs according to P&ID are in vendor scope	
26			
27	10	Pulsation dampeners are required on discharge of each stage.	
28			
29	11	Process turndown is 35% of Winter Case Flowrate.	
30			
31	12	the risk of hydrate formation.should be consideredd after the coolers by client, out of havayar B.L	
32			
33	13	Material requirement in contact with wet process gas shall be in compliance with NACE MR 0175/ISO 15156	
34			
35	14	Instruments and control shall be supplied according to specification for instrumentation. And specification for instrument and control of package unit system.	
36			
37			
38	15	Complete Electrical and Instrumentation Installation, JB, Tube and Fitting, Cabling, Tray,... Inside of skid is in Vendor's scope of supply.	
39			
40			
41	16	Vibration , tempearture & rod drop sensor & monitoring as per approval OVERAL CONTROL/SAFETY SYSTEM CONFIGURATION DIAGRAM document.	
42			
43	17	Voltage, Electric Power, Current and Power factor will be specified	
44			
45	18	Suction and Discharge line Diameters/ Ratings:	
46		1st Stage2nd Stage	
47		DiameterRatingDiameterRating	
48		Suction line:10"300#6"600#	
49		Discharge line:10"300#6"600#	
50			
51	19	Vendor is responsible to provide PC based operator workstation, and all required software source and licenses	
52		required for monitoring and configuration.	
53			
54	20	For electric motors, starting method is D.O.L .	

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک (قرارداد BK-HD-GCS-CO-0008_03)	 HAVAYAR INDUSTRIAL GROUP
شماره پیمان: 053 - 073 – 9184	DETAILED D/SH FOR COMPRESSOR (API-618) WITH CERTIFICATES	شماره صفحه : 24 از 24
	نسخه سریال نوع مدرک رشته تسهیلات صادرکننده بسته کاری پروژه	
	V03 0001 DS ME 120 HY GCS BK	

NOTES

1	21	Safety Valve Set Pressure (Inlet / Discharge) refer to Approved PID "BK-GCS-HY-120-PR-PI-0001"	Rev
2			
3	22	Site Condition:	
4		Min .Ambient temperature(°C): 5 °C	
5		Max .Ambient temperature(°C): 55 °C	
6		Maximum Relative Humidity: 100 %	
7		Minimum Relative Humidity: 0	
8		Elevation from sea level ~ 12.5 m	
9			
10	23	LCP for each compressor IP66,Ex certificate will be suplied by vendor as per project specification.	
11			
12	24	Unloader Valves require at least 4 barg pressure of instrument air and client's specified pressure of 3 barg will lead to lack of actuation.	
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