
 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>																									
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	<table><tr><th colspan="8">SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES</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>D03</td><td>0004</td><td>SP</td><td>ME</td><td>120</td><td>PEDCO</td><td>GCS</td><td>BK</td></tr></table>	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES								نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه	D03	0004	SP	ME	120	PEDCO	GCS	BK	شماره صفحه : ۱ از ۱۲
SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES																										
نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
D03	0004	SP	ME	120	PEDCO	GCS	BK																			

طرح نگهداشت و افزایش تولید ۲۷ مخزن

SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES

نگهداشت و افزایش تولید میدان نفتی بینک

D03	AUG. 2022	AFD	H. Adineh	M.Fakharian	M. Mehrshad	
D02	NOV. 2021	IFA	H. Adineh	M.Fakharian	M. Mehrshad	
D01	OCT. 2021	IFA	H.Adineh	M.Fakharian	Sh.Ghalikar	
D00	AUG. 2021	IFC	M.Asgharnejad	M.Fakharian	Sh.Ghalikar	
Rev.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	CLIENT Approval

Class: 2

Company Doc. Number: F0Z-708822

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



IFI: Issued For Information

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>																									
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	<table><tr><th colspan="8">SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES</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>D03</td><td>0004</td><td>SP</td><td>ME</td><td>120</td><td>PEDCO</td><td>GCS</td><td>BK</td></tr></table>	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES								نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه	D03	0004	SP	ME	120	PEDCO	GCS	BK	شماره صفحه: ۲ از ۱۲
SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES																										
نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
D03	0004	SP	ME	120	PEDCO	GCS	BK																			

REVISION RECORD SHEET



PAGE	D00	D01	D02	D03	D04
1	X	X	X	X	
2	X	X	X	X	
3	X				
4	X	X	X		
5	X	X			
6	X	X			
7	X		X		
8	X				
9	X	X			
10	X	X			
11	X				
12		X			
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					

PAGE	D00	D01	D02	D03	D04
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					
81					
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					
92					
93					
94					
95					
96					
97					
98					
99					
100					
101					
102					
103					
104					
105					
106					
107					
108					
109					
110					
111					
112					
113					
114					

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>																	
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	<p>SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES</p> <table><tr><td>نسخه</td><td>سریال</td><td>نوع مدرک</td><td>رشته</td><td>تسهیلات</td><td>صادرکننده</td><td>بسته کاری</td><td>پروژه</td></tr><tr><td>D03</td><td>0004</td><td>SP</td><td>ME</td><td>120</td><td>PEDCO</td><td>GCS</td><td>BK</td></tr></table>	نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه	D03	0004	SP	ME	120	PEDCO	GCS	BK	شماره صفحه: ۳ از ۱۲
نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه											
D03	0004	SP	ME	120	PEDCO	GCS	BK											

CONTENTS

1.0	INTRODUCTION	4
2.0	SCOPE	5
3.0	NORMATIVE REFERENCES	5
4.0	TECHNICAL SPECIFICATION.....	7

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES							شماره صفحه : ۴ از ۱۲	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	ME	SP	0004	D03	

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.

As a part of the Project, a New Gas Compressor Station (adjacent to existing Binak GCS) shall be constructed to gather of 15 MMSCFD (approx.) associated gases and compress & transfer them to Siahmakan GIS.

GENERAL DEFINITION

The following terms shall be used in this document.

CLIENT:	National Iranian South Oilfields Company (NISOC)
PROJECT:	BINAK Oilfield Development – Surface Facilities; New Gas Compressor Station
GENERAL CONTRACTOR (GC):	Petro Iran Development Company (PEDCO)
EPC CONTRACTOR:	Joint Venture of : HIRGAN Energy – Design & Inspection(D&I) Companies
VENDOR:	The firm or person who will fabricate the equipment or material.
EXECUTOR:	Executor is the party which carries out all or part of construction and/or commissioning for the project.
THIRD PARTY INSPECTOR (TPI):	The firm appointed by EPD/EPC CONTRACTOR(GC) and approved by COMPANY (in writing) for the

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES								شماره صفحه : ۵ از ۱۲
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	ME	SP	0004	D03	

inspection of goods.

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 Company rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR.
MAY:	Is used where a provision is completely discretionary.

2.0 SCOPE



This document defines a procedure for the supply of centrifugal pumps for general services and is intended to supplement the Iranian Petroleum Standard IPS-M-PM-115(1), "Material and Equipment Standard for Centrifugal Pumps for General Services", issued May 2006 , which in turn is supplement to ISO 5199(2002)"Technical Specification for Centrifugal Pumps Class II".

3.0 NORMATIVE REFERENCES

The latest edition of following codes & standards are applicable in this project (unless otherwise mentioned):

3.1 LOCAL CODES AND STANDARDS

- IPS-M-PM-320 Material And Equipment Standard For Lubrication, Shaft Sealing And Control-Oil Systems And Auxiliaries For Process Services.
- IPS-M-EL-110 Engineering Standard For Hazardous Area (2012).
- IPS-G-SF-900 General Standard For Noise Control And Vibration (2015).
- IPS-E-EL-100 Engineering Standard for Electrical System Design.

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES							شماره صفحه : ۶ از ۱۲	
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	ME	SP	0004	D03	

➤ IPS-M-EL-161(2)



Material and Equipment Standard
for Electrical Items.

3.2 INTERNATIONAL CODES AND STANDARDS

- | | | |
|-------------------|--|------|
| ➤ ASME/ANSI B16.1 | Cast Iron Pipe Flange And Fitting. | 2020 |
| ➤ ASME/ANSI B16.5 | Steel Pipe Flange And Fitting. | 2020 |
| ➤ ISO 5199 | Specification for Centrifugal Pumps. | 2002 |
| ➤ ISO 2858 | End- Suction Centrifugal Pumps
(Rating with 16 bars). | 1975 |
| ➤ BS EN 733 | End- Suction Centrifugal Pumps
(Rating with 10 bars). | 1995 |
| ➤ ISO 9906 | Rotodynamic Pumps-Performance Tests. | 2012 |
| ➤ IEC 60034 | Rotating Electrical Machines- All Parts. | 2021 |

3.3 THE PROJECT DOCUMENTS

- | | |
|-------------------------------------|--------------------------------------|
| ➤ BK-GNRAL-PEDCO-000-EL-DC-0001 | Electrical System Design Criteria. |
| ➤ BK-GNRAL-PEDCO-000-EL-SP-0017 | Specification For MV Electro Motors. |
| ➤ BK- GNRAL - PEDCO -000-EL-SP-0010 | Specification For LV Electro Motors. |
| ➤ BK- GNRAL - PEDCO -000-PR-DB-0001 | Process Basis of Design. |
| ➤ BK-GNRAL-PEDCO-000-PI-SP-0007 | Specification For Lining. |

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>							
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES							شماره صفحه: ۷ از ۱۲
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
	BK	GCS	PEDCO	120	ME	SP	0004	D03

- BK- GNRAL - PEDCO -000-PI-SP-0006 Specification For Painting.
- BK-GNRAL- PEDCO -110-IN-DB-0001 Instrument & Control System Basis of Design.
- BK-GCS-PEDCO-120-PI-RT-0001 Corrosion Study & Material Selection Report.
- BK-GNRAL-PEDCO-000-IN-SP-0001 Specification For Instrumentation.
- BK-GCS-PEDCO-120-PI-SP-0001 Piping Material Specification.

3.4 ENVIRONMENTAL DATA

Refer to "Process Basis of Design; Doc. No. BK- GNRAL - PEDCO -000-PR-DB-0001

3.5 CONFLICTING REQUIREMENTS

In case of any conflict between the contents of this document or any discrepancy between this document and other project documents or reference standards, this issue must be reported to the CLIENT. The final decision in this situation will be made by CLIENT.

4. TECHNICAL SPECIFICATION

4.1 Units



SI metric system of measurement including "°C" and "bar" shall be used in design of the equipment except for flange ratings which shall be "psi" and pipes, pipe fitting sizes and nozzle dimensions which shall be "inches".

4.2 Acceptability Criteria

Vendor shall not offer prototype design or a design with less than 2 years of successful operation in similar service.

A reference equipment/ Company list shall be submitted together with proposal.

The Vendor may offer alternative designs for Company's consideration and approval. Obviously

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES								شماره صفحه: ۸ از ۱۲
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	ME	SP	0004	D03	

the proposed equipment should have similar performances and the supplier will guarantee them.

4.3 Deviations

No deviations from project specifications, this general specification or the API/IPS standards are allowed, without prior written approval of the Company.

4.4 Guidelines

General Service Pump shall be designed and fabricated according to IPS. In this regard, the amendments/supplements to IPS given in this specification are directly related to the equivalent sections or clauses in IPS. For clarity, the section and paragraph numbering of IPS has been used as far as possible. Where clauses in IPS are referenced within this specification, it shall mean those clauses are amended by this specification. Clauses in IPS that are not amended by this specification shall remain valid as written.

Sub. (Substitution) "The clause in IPS shall be deleted and replaced by the new clause in this specification".

Del. (Deletion) "The clause in IPS shall be deleted without any replacement".

Add. (Addition) "The new clause with the new number shall be added to the relevant section of IPS".

Mod. (Modification) "Part of the clause or paragraph in IPS shall be modified and/or the new description and/or statement shall be added to that clause or paragraph as given in this Specification".



AMENDS TO IPS-M-PM-115:

4. DESIGN

4.1. General

4.1.2 (Sub.)

The rated flow may be within the region of 70-120 % of best efficiency point of the furnished impeller. Pumps shall have stable head capacity curves which continuously rise to shut off. The shut off head at rated speed shall be between 110 to 120 percent of the head at rated capacity,

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES								شماره صفحه: ۹ از ۱۲
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	ME	SP	0004	D03	

except where approved otherwise by Client/Purchaser. the rated impeller diameter shall not be greater than 97% of the maximum impeller diameter and not less than 105% of minimum impeller diameter.

For pumps operating in parallel, the minimum head rise to closed valve shall be 15%.

The percentage head rise may be reduced for multi- stage pumps(3 stage or more), subject to the client/ purchaser's approval. For pumps operating in parallel, "as tested" head/flow characteristic shall conform to the following:

- Shut off head shall be same in each pump.
- Head difference between any two pumps shall not exceed 3% between 80% and 110% of rated flow.
- Head difference between any two pumps shall not exceed 5% for capacities between minimum continuous flow and 80% rated flow, and between 110% rated flow and end of curve flow.

4.1.4 (Add.)

(Substitution to 4.1.4 of ISO 5199)

All equipment covered by this specification shall be designed for outdoor operation. Site conditions and climatic data are specified in "Process Basis of Design" of relevant reservoir.

4.2. Prime Movers



The referred standard shall be modified to project relevant specification for induction motors as listed in section 3.1 of this specification.

4.2.1. (Add.)

Electrical motor should be sized based on Figure 2, paragraph 4.2 of ISO 5199 but shall not be less than 125% of pump's mechanical power at all range of motor operation from end curve to shut off.

4.2.2. (Add.)

Electrical motors shall be appropriate for working temperature or Maximum Ambient Temperature whichever is greater.

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>							
شماره پیمان:	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES							شماره صفحه : ۱۰ از ۱۲
۰۵۳ - ۰۷۳ - ۹۱۸۴	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	ME	SP	0004	D03

4.4. (Add.) Pressure Containing Parts

4.4.1. (Add.)

(Modification to clause 4.4.1 of ISO 5199)

In addition to the requirement of this clause, maximum allowable working pressure (M.A.W.P) shall be at least the maximum discharge pressure plus 10% of the maximum differential pressure by considering maximum impeller for calculating maximum discharge pressure.

4.5.3 (Add.)

(Modification to clause 4.5.3 of ISO 5199)

The pump casings shall be provided with a drain connection at its lowest point. Drains shall be piped and valved to the edge of the base plate and suitably braced.

4.6.(Add)

(Modification to clause 4.6 of ISO 5199)

Nozzle loads shall be at least 2 times of ISO 5199.

4.13.3.1 (Mod.) Type and arrangement

All mechanical seals shall be cartridge type and according to API 682 fourth edition. The supplier may apply for a deviation for compliance with API 682, due to pump stuffing box dimensions constraint. This shall be subject to Client/Contractor's approval.

4.13.4 (Mod.) Stuffing box

Stuffing boxes on packed pumps shall have provision for seal cages (lantern rings) for the introduction of a cooling medium directly into the packing. Inlet and outlet connections shall be provided for the seal cage.



Packing for stuffing boxes shall be a minimum of 10 mm (3/8 in) square; however, a packing size of at least 12.5 mm (1/2 in) is preferred. Packing shall be packaged separately for installation in the field.

4.15 (Mod.) Couplings

Couplings shall be of two-piece, flexible, spacer type, permitting change of flexible membrane without disturbing the alignment of shafts. Coupling shall be of stainless steel flexible element with steel coupling hubs provided with spacer.

Couplings shall be designed for the maximum torque/power to be transmitted.

Coupling guard shall be made of non sparking material unless otherwise specified in the

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>							
شماره پیمان:	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES							شماره صفحه : ۱۱ از ۱۲
۰۵۳ - ۰۷۳ - ۹۱۸۴	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	ME	SP	0004	D03

data sheet.

Coupling guard shall be designed for a vertical loading of at least 90 kg.

Flexible couplings shall not be used to compensate for misalignment of the pump and driver shafts.

5. Materials

5.2 (Mod.) Material Composition and Quality

Material of construction shall be as per ASTM standards. In special cases DIN, BS or any other well known international materials as substituted materials to ASTM ones can be selected, after granting client's approval, if they are equivalent or superior to ASTM ones. The certification should be presented. For major components the Vendor shall provide details as chemical composition and mechanical properties in case of non-ASTM / or non ASME materials and shall be approved by Contractor's/Client.

Unless otherwise specified, supplier shall provide, traceability of materials used for pressure parts, impeller and shaft. All materials shall be provided with inspection/test certification in accordance with BS EN 10204. For all pressure-containing parts and wetted parts at least an EN10204:2004 type 3.1 certificate is required.

Asbestos shall not be used in any form.

5.3 (Mod.) Repairs

Procedures for major repairs shall be approved by Contractor before rectification.

After weld repair all castings shall be post weld heat treated as required by casting specification.

All weld repairs shall be visually examined and undergo magnetic particle inspection or Dye penetration examination.



6. SHOP INSPECTION & TESTS

6.3.3 Hydrostatic test

6.3.3.1 (Mod.)

Test pressure shall be maintained for at least 60 min without visible leakage or pressure drop.

The chloride content of test water shall be less than 50 P.P.M. for Austenitic Stainless Steel materials. The mechanical seals and the gland shall not be used during the hydrostatic test.

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR CENTRIFUGAL PUMPS FOR GENERAL SERVICES							شماره صفحه : ۱۲ از ۱۲	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	ME	SP	0004	D03	

6.3.4.12 (Add.)

Electrical motors shall be tested and inspected according to the requirements of relevant specifications and standards mentioned in section 3.1 of this specification.

9. GUARANTEE

9.3. (Add.)

Vendor shall guarantee the possibility of spare parts supplying and also any required technical services for at least ten years after operation.