

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک							
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طرح نگهداشت و افزایش تولید ۲۷ مخزن

SPECIFICATION FOR RECIPROCATING COMPRESSOR (API 618)

نگهداشت و افزایش تولید میدان نفتی بینک

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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

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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.

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.

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THIRD PARTY INSPECTOR (TPI): The firm appointed by EPD/EPC CONTRACTOR(GC) and approved by CLIENT (in writing) for the 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 CLIENT rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR.

MAY: Is used where a provision is completely discretionary.

2.0 SCOPE

This specification covers the minimum requirements for Reciprocating compressors for process gas services which shall conform to the Iranian Petroleum standard IPS-G-PM-200(2) Jan.2010, which is amend to API 618, 5th December 2007.

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-G-PM-120 General Standard for Accessibility and Safety OF Machineries.
- IPS-I-PM-305 Standard for Periodical Inspection OF Machineries.
- IPS-M-PM-320 Material and Equipment Standard for Lubrication, Shaft Sealing And Control-Oil Systems and Auxiliaries for Process Services.
- IPS-E-PM-100 Engineering Standard for General Design Requirements

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OF Process Machineries.

- IPS-E-PM-110 Engineering Standard for Technical Evaluation OF Machineries.
- IPS-E-PM-120 Engineering Standard for Accessibility and Safety OF Machineries.
- IPS-M-EL-131(2) Material and Equipment Standard for Low Voltage Induction Motors (2009).
- IPS-E-EL-100(1) Engineering Standard for Electrical System Design.
- IPS-M-EL-161(2) Material and Equipment Standard for Electrical Items.
- IPS-M-EL-132(2) Material And Equipment Standard For Medium And High Voltage Induction Motors (2009).
- IPS-M-PM-211 Material and Equipment Standard For Reciprocating Compressor for Instrument Air Services.
- IPS-C-PM-216(1) Construction Standard for Process Machineries Assembling And Installation.
- IPS-G-GN-210 General Standard for Packing & Package.
- IPS-G-SF-900 Noise Control and Vibration.
- IPS-I-EL-217(2) Inspection Standard for Pre commissioning Electrical Tests.
- IPS-M-EL-143(2) Material and equipment standard for low voltage switchgear and control gear.
- IPS-M-EL-144(2) Material and Equipment Standard for Medium and High Voltage Switchgear and Control gear.
- IPS-M-EL-138(1) Material and Equipment Standard for Synchronous Generators.
- IPS-M-PM-290(2) Material and Equipment Standard for Reciprocating Internal Combustion Engines.

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- NISOCS-M-EL-131 Material and Equipment Standard for Low Voltage Induction Motors.

3.2 INTERNATIONAL CODES AND STANDARDS

- API 618 Reciprocating Compressors for Petroleum Chemical, and Gas Industry Services. 5th Edition, 2007
- API 671 Special- Purpose Couplings for Petroleum, Chemical and Gas Industry Services. 4th Edition, 2007
- API 614 Lubrication, shaft sealing and oil control systems and Auxiliaries. 5th Edition, 2008
- API 613 Special Purpose Gear Units for Petroleum, Chemical and Gas Industry Services. 5th Edition, 2003
- API 670 Machinery Protection Systems. 5th Edition, 2014
- NACE MR 0175 Petroleum and Natural Gas Industries- Material for Use in H₂S Containing Environments In Oil and Gas Production. 2015
- ASME Sec.VIII Rules for Construction of Pressure Vessels. 2017
- IEC 60034 Rotating Electrical Machines.
- EEMUA 140 Noise Procedure Specifications.
- ASTM American Society for Testing Materials (Relevant Parts).
- ASME B31.3 Chemical Plant & Petroleum Refinery Piping.

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- ASME B16.5 Pipe Flanges and Flanged Fittings.
- BS EN 10204 Metallic Products- Types of Inspection Documents.

3.3 THE PROJECT DOCUMENTS

- 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-EL-DC-0001 Electrical System Design Criteria.
- BK- GNRAL -PEDCO-000-PR-DB-0001 Process Basis of Design.
- BK- GNRAL -PEDCO -000-PR-DC-0001 Process Design Criteria.
- BK- GNRAL- PEDCO-000-ME-DC-0001 Mechanical Design Criteria.
- BK-GCS- PEDCO -120-PI-SP-0001 Piping Material Specification.
- BK-GNRAL-PEDCO-000-PI-SP-0006 Specification for Painting.
- BK-GNRAL-PEDCO-000-QC-PR-0018 NDT Procedure.
- BK-GNRAL-PEDCO-000-QC-PR-0015 Specification for Welding procedure.
- BK- GCS - PEDCO -120-IN-DB-0001 Instrument & Control System Basis Of Design.
- BK- GNRAL - PEDCO -000-IN-SP-0001 Specification for Instrumentation.

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک							
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- BK- GNRAL - PEDCO -000-IN-SP-0002 Specification for Control System.
- BK- GNRAL - PEDCO -000-PI-SP-0008 Specification for Material Requirements in Sour service.
- BK- GNRAL - PEDCO -000-EL-SP-0011 Specification for Electrical Requirements of Package Units.

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.

4.0 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/ CLIENT list shall be submitted together with proposal. The Vendor may offer alternative designs for CLIENT's consideration and approval. Obviously the proposed equipment should have similar performances and the supplier will guarantee them.

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4.3 Deviations

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

4.4 Guidelines

Compressors 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 paragraph in IPS shall be deleted and replaced by the new paragraph in this specification".

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

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

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

5.0 AMENDMENT TO IPS-G-PM-200(2):

3. DEFINITIONS OF TERMS

3.63. (Add.)

Compressor set: Complete compression unit including base plate, compressor, driver, lubrication system, seal system and where applicable, pulsation suppression devices, cooling system, gear and control system.

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3.64. (Add.)

Supplier shall clarify the expected values of pressure drop or power requirement of the various elements of his supply (for information). The determination of rated power shall include any necessary allowance on all expected values.

6. BASIC DESIGN

6.1. General

6.1.23. (Add.)

(Modification to 6.1.23 of API 618) Supplier shall also calculate the isentropic compression coefficient and indicate the gas state equations used for determination of gas parameters. Supplier may be required to use gas parameters values calculated by CLIENT.

6.6 Rod and Gas Loads

6.6.1(Add.)

(Modification to 6.6.1 of API 618)

The maximum actual rod loading shall not exceed 85% of the Manufacturer's maximum allowable continuous rod loading.

6.7. Critical Speeds

6.7.5. (Add.)

EFRC Certificates (Guide Lines for Vibration in Reciprocating Compressor May 2012) is Reference Criteria for Vibration.

6.12. Distance Pieces

6.12.1.1 (Mod.)

Non-Lubricated cylinders for air shall be designed with simple extra long distance pieces' type B.

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The seals shall be designed in such a way that under no circumstance the medium can enter the motion work casing.

Vents and drains (min. 1") and lateral openings with tight closing covers shall be provided for each chamber.

7. ACCESSORIES

7.1. Drivers

7.1.2. Motor Drivers

7.1.2.1. (Add.)

(Modification to 7.1.2.1 of API 618)

Except otherwise specified or requested by Supplier, electric motors shall be suitable for direct starting with the compressor pressurized but unloaded. The starting voltage shall be assumed as 80% of nominal voltage at motor terminals. The barring equipment shall be fitted on the compressor with limit switches supplied by the Supplier for safety with this equipment.

7.1.2.5 (Sub.)

Electrical motors to be As per Project Specifications, LV Induction motors: BK-00-PEDCO-000-EL-SP-0010, or Specification for MV Induction Motors: BK-00-PEDCO-000-EL-SP-0017.

7.1.2.8 (Add.)

(Modification to 7.1.2.8 of API 618)

Keyless interface fits are not acceptable.

7.6. Controls and Instrumentation

7.6.1. General

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7.6.1.1. (Add.)

(Modification to 7.6.1.1 of API 618)

The Instrumentation of this document shall comply with BK-00-PEDCO-000-IN-SP-0001, Specification for Instrumentation and BK-00-PEDCO-000-IN-SP-0002, Specification for Control System.

7.6.4.3. Temperature Measurement

7.6.4.3.4. (Add.)

(Modification to 7.6.4.3.4 of API 618)

2 sets of RTDs shall be considered for each bearing.