



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

عمومی و مشترک



شماره پیمان:

۰۵۳ - ۰۷۳ - ۹۱۸۴

SPECIFICATION FOR DISTRIBUTION & LIGHTING PANELS

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D03	0013	SP	EL	000	PEDCO	GNRAL	BK

شماره صفحه : ۱ از ۱۱

طرح نگهداشت و افزایش تولید ۲۷ مخزن

SPECIFICATION FOR DISTRIBUTION & LIGHTING PANELS

نگهداشت و افزایش تولید میدان نفتی بینک



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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 Company 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.

GENERAL DEFINITION

The following terms shall be used in this document.



CLIENT:	National Iranian South Oilfields Company (NISOC)
PROJECT:	Binak Oilfield Development – General Facilities
EPD/EPC 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 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.

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2.0 SCOPE

This specification covers the minimum requirements for design, manufacture & testing for Low Voltage Distribution Panel used in “Binak Oilfield Development”.

3.0 NORMATIVE REFERENCES

3.1 Local Codes & Standards

IPS-M-EL-240 Material and Equipment Standard for Low Voltage Industrial and Flameproof AC Switch-Fuse Assembly

3.2 International Codes & Standards

IEC 60269 Low Voltage Fuses
IEC 60446 Identification of Insulated Wires and Bare Conductors by Colors
IEC 60529 Degrees of Protection Provided by Enclosures (IP Code):
IEC 60947 Low Voltage Switchgear Control Gear
IEC 61810 Protective Relays

3.3 Environmental Data

The installation site is in south of Iran with corrosive, hot and high humid atmosphere. Therefore, all equipment shall be designed to fully comply with the performance specification in the environmental conditions. For more information refer to “Process Basis Design; section 11”.

For the Ambient Conditions, Special Care should be paid to:

- Enclosures of Equipment for Outdoor Installation
- Painting and Coating of Metal Parts to Resist to the Severe Environmental Conditions

Any environmental derating factors shall be considered by vendor before design.

D02

3.4 Order of Precedence



In case of conflict between requirements specified herein & the requirements of any other referenced document, the most approved stringent requirements of below listed items shall be considered based on the approval given by the owner’s representative:

Purchase order

Material Requisition

MTO & Data Sheet

This Specification

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Drawing & Other Specification

Reference Project Specification

Iranian Petroleum Standard (IPS)



Reference international Code & Standards

When the term “Authorized”, Authorization”, “Approval”, or “Approved” are used in this specification, it shall mean authorization or Approval from OWNER.

In case of any conflict between the project documents, the most stringent one shall be considered.



4.0 GENERAL DESIGN CHARACTERISTICS

- 4.1 The panel board assembly, which is outdoor type shall be protected against dust with the enclosure degree of protection IP 55W and for indoor type shall be with the enclosure degree of protection IP42. The body of panel shall be made of steel sheet and thickness of the steel shall not be less than 2 mm (for outdoor type).
- 4.2 The assembly enclosure cooling shall be natural convention and shall be suitable for free standing or surface mounting wall type.
- 4.3 Where required the Purchaser's drawings attached will show the preferred size and arrangement of the equipment.
- 4.4 The AC distribution panel boards shall be supplied from 400 V, 3 phase and neutral buses and shall be provided with a mould case circuit breaker (MCCB) or miniature circuit breakers (MCB) and outgoing which contain miniature circuit breakers according to IEC 60947-2 and shall feed the lighting and maintenance services power supply of the plant.
- 4.5 The panels shall be dead front type steel enclosures and lockable hinged doors.
- 4.6 Each panel shall be suitable for the area classification in which it is installed on the basis of relevant Data Sheets/Schedules.
- 4.7 All panel boards shall have 20% spare and 20% space.
- 4.8 Incoming molded case circuit breaker of panel shall be considered 4 pole and other MCB's shall be considered 3 or 2 pole.
- 4.9 All breaker shall be chosen according the short circuit calculation of system and bus-bars also shall be suitable for short circuit current.
- 4.10 All terminals shall be solderless clamp types.
- 4.11 The necessary ground lugs shall be provided for grounding the panels.

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5.0 BASIC CONSTRUCTION

- 5.1 The panels assembly shall be of integral construction and consist of rack mounted clamp and weather proof cubicles, mounted on free standing vertical pedestal frame work, dead front industrial type with three phase bus bar plus neutral system.
- 5.2 The assembly shall contain power buses, contactor supply units, instrument transformers, meters, control and meter switches and all necessary controlled service.
- 5.3 The assembly shall be designed for front access. Panels shall have removable plate (bottom and top) or threaded holes (bottom and top) for conduits/cable entry. Entry type shall as per data sheet/schedule. All equipment shall be mounted on the front of the panels, unless otherwise specified in drawings and/or data sheets.
- 5.4 Number of feeders, their rating, controlling and protection requirements and indicated in the schedules and drawings attached to purchase.
- 5.5 All equipment shall be designed to withstand the effects of internal and external faults at the point of application.
- 5.6 The assembly and associated feeder units and components shall withstand the short circuit level.
- 5.7 The panels shall be supplied complete with all necessary brass compression type cable glands and stud terminal blocks with at least 20% spare terminal for the purchaser's future use. Ex.-type cable gland shall be provided on assembly for the classified panels.
- 5.8 Terminals related to the incoming feeder cables shall be correctly sized to accept the specified cables. Feeder's cable size type and quantity will be notified at the contract stage.
- 5.9 All terminal strips shall be treated with anti-fungus varnish.
- 5.10 All panel control devices such as push buttons, selector switches, pilot lights, and other such items shall be of the single unit, heavy-duty type.
- 5.11 Control switches, meter switches meters selector switches position indicating lights, protective relays, etc. shall be mounted on the front of the panels and shall be flush type and sealed against the ingress of dust and moisture.
- 5.12 Each assembly shall be complete in all respects with all bus bars, auxiliary wiring, terminals, fuses, labels, cable boxes, cable glands, cable lugs, fixing bolts washers lifting, facilities and other accessories required.

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- 5.13 All terminals shall be suitable for connection to conductors with minimum cross sectional 2.5 mm².
- 5.14 All panel boards shall have a circuit directory card in a frame with a plastic cover installed on the inside of the panel door. All directory cards shall be properly filled in (using a type writer) indicating all areas and devices served by each circuit.

6.0 BUSBAR



- 6.1 Power buses shall be hard drawn, high conductivity copper and shall be painted with 3 different colors. The buses shall be mechanically braced to withstand minimum short circuit level and duration specified in Data Sheet.
- 6.2 A separate ungrounded, neutral bus bar with minimum half capacity of the phase bus shall be provided, the neutral bus shall be located along with the power buses and shall extend the entire length of the assembly.

7.0 FUSES

- 7.1 Fuses if used shall be HRC cartridge type in accordance with IEC 60269 with the breaking capacity of at least 6 OR 10 kA RMS symmetrical at 600 Volts AC.
- 7.2 The rating of the fuses shall be according to IEC recommendations unless otherwise shown on the purchaser's documents.

8.0 CONTACTOR

- 8.1 Contactors shall be of the air break electro-magnetically operated type. The magnet operating coil to be class "F" insulated, air cooled, continuously rated and normal wound for line to neutral voltage.
- 8.2 The whole block contactor assembly shall comply with IEC 60947-4 and to be suitable for uninterrupted duty and intermittent duty class 1 and utilization category AC3 unless specified otherwise.
- 8.3 Each contactor shall be equipped with the necessary number of auxiliary contacts plus 1 N/C and 1 N/O spare auxiliary contacts wired out to the terminal blocks for the purchaser's future use.
- 8.4 Control voltage shall be 230 Volt AC derived from bus bar power supply with neutral bus with a protection fuse.

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9.0 MINIATURE CIRCUIT BREAKER



- 9.1 MCB's shall be for on-load operation and rated as shown on the Purchaser's documents.
- 9.2 MCB's shall be equipped with earth leakage relay with a 30 mA rating.
- 9.3 Single phase loads shall be controlled by double-pole MCB's.
- 9.4 MCB's shall not considered as on-off switching device. in case of required, separate manual rotary switch shall be considered.

10.0 EARTHING

- 10.1 The switch board assembly shall be fitted with a solid copper earth bar at least 25×3 mm in dimension, running the complete length of the board in the base frame.
- 10.2 All non-current carrying metals shall be bonded to the earth bar.
- 10.3 Terminals for connection to the external earthing shall be provided.

11.0 WIRING

- 11.1 Minimum wire size for the boards internal wiring shall be 2.5 mm² for alarm and indications and 2.5 mm² for command/protection signals and small power supplies. All wires shall be 600 V grade PVC insulated. All jumper connections shall be of the flexible equipment.
- 11.2 All wiring shall run on suitable cleats in harness formation with different colors and ferruled for identification.
- 11.3 Connecting points for power and control conductors shall be clearly identified with phase and circuit reference number in line with appropriate drawings. Each wire shall be fitted with a plastic ferrule or heat shrink sleeve. Plastic ferrule or PVC electrical tape shall be colored to Mach insulation color. Adhesive type identification is not acceptable move.
- 11.4 All terminal board point shall be identified with printed wire numbers on a center mounted strip. All wires shall be terminated at plug-in type terminal blocks. All internal control wiring shall be identified by the use of numbered plastic sleeves or by direct printing on the wire.
- 11.5 Identifying and numbering of cables and wires for each feeder shall be in horness with the schemes and drawings attached to purchase documents and shall be applied to the relevant Vendor's Drawings.

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12.0 LABELS/NAMEPLATES

- 12.1 Labels/Nameplates identifying each circuit service shall be affixed to the cover door of the related units, labels/nameplate descriptions shall be in accordance with the purchaser's schedules and drawings in Data sheets.
- 12.2 Nameplates shall be fastened to the door by pop rivets or screws. Glued or "press on" type fastening is not acceptable wording on nameplates, instruction signs instrument scales, etc. shall be in English.
- 12.3 Component items such as contactors, etc. shall have labels affixed in a readable position identifying their characteristics.

13.0 FINISH

- 13.1 The assembly enclosures shall be cleaned, degreased, primed, and painted in accordance with the manufacturer's standard industrial stove enamel glass finish dark gray.
- 13.2 Vendor shall supply paint, matching each color used, for field "touch-up" after installation of the equipment. Two spray cans of each color shall be supplied per assembly.

14.0 SPECIAL TOOLS & SPARE PARTS



- 14.1 The Vendor shall supply a set of any special tools necessary for maintenance purpose for classified or non-classified panels.
- 14.2 The Vendor shall also include any recommended spare parts for commissioning.
- 14.3 Spare compartments shall be fully equipped for the service function and rating as specified in drawings attached to purchase documents.

15.0 TEST

- 15.1 TEST specified in the referenced standards shall be performed including the following:
 - 1) Magnetization characteristics and primary injection of current transformers.
 - 2) Operation of all meters and relays using single phase or three phase supply as required: operation of relay contacts.
 - 3) Megger test

16.0 DOCUMENTATION

The Vendor shall deliver documents and information as listed below:

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- a) All arrangement drawings
- b) Data sheet (completed by vendor)
- c) All equipment used (manufacturer, capacity part no., etc.)
- d) Single line diagrams of panels
- e) Dimensions of panel
- f) Test reports
- g) Wiring, schematic diagram
- h) Maintenance, commission manual
- i) Two years spare parts list