RUNIN Switchgear Manufacturer	Technical Proposal Project Name: Binak Oilfield Development General Purchaser: Hirgan Energy Our Reference : R1402 P 107, Rev 00	شرکت رانین صنعت گستر سازنده تابلو برق

M.V Switchgear UNISAFE

With ABB Circuit Breaker

up to 24 kV

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Technical Descriptions

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1. Unisafe description

These cubicles with withdrawable circuit-breakers for indoor installation are designed based on metal clad type with the bellow technical data:

Rated voltage	kV	**12**	**17.5**	**24**
Rated insulation voltage	kV	12	17.5	24
Test voltage at power frequency	kV 1min	28	38	50
Impulse withstand voltage	kV	75	95	125
Rated frequency	Hz	50-60	50-60	50-60
Rated short-time withstand current	kA 1s	...50	...50	...25
Peak current	kA	...125	...125	...63
Rated short-time withstand current	kA 3s	...40	...40	...25
Peak current	kA	...100	...100	...63
Internal arc withstand current	kA 1s kA 0.5s	...40 ...50	...40 ...50	...25 –
Main busbar rated current	A	...4000	...4000	...2500
Rated current of the branch connections	A	630 1250 1600 2000 2500 3150	630 1250 1600 2000 2500 3150	630 1250 1600 2000 – –
Rated current of the branch connections with forced ventilation	A	3600 4000	3600 4000	2500 –

Unisafe is a medium voltage, metal-clad switchgear suitable for indoor installations. It is a modular apparatus made of aligned standard units. Metal sheets segregate each compartment and the energized components are air insulated.

All the startup, maintenance and service operations can be carried out from the front of the unit. The switchgear and the earthing switches are operated from the front with the door closed. The switchgear can be wall-mounted. The range of apparatus available for Unisafe ZS1 switchgear is the most complete on the market, including vacuum and gas circuit-breakers.

From power stations down to distribution substations, ABB provides a reliable, high quality solutions for products, systems and services.

As a single source partner, ABB is the world’s largest and most complete supplier of switchgear and systems for electric power transmission and distribution applications.

ABB substations, cables, transformers, control systems and switchgear enable our customers to make efficient and effective use of electric power.

As a word-leading company in research, development and innovation, ABB is able to provide the most comprehensive and suitable range of solutions to meet the present and future needs of producers, distributors and users of electric power.

Medium voltage switchgear is one of the most important links in the electric distribution chain and ABB has developed the Unisafe switchgear with the aim of satisfying all requirements.

Unisafe combines consolidated solutions and innovative components, based on ABB's leading-edge technology.

Unisafe is medium voltage metal-clad switchgear with a metal enclosure, suitable for indoor installations.

Metal partitions segregate the compartments from each other and the live parts are air-insulated. The switchgear is modular and this provides a coordinated approach that enables the ideal solution for each installation to be built up by placing standardised units side by side.

The metal sheets used on this structure of switchgears is 2.5 mm thickness.

In connection with LV part of compartment we can be used a sheet metal with thickness of 2 mm.

The switchgear is simple to configure and selection of the correct apparatus and instruments for specific applications does not require dedicated solutions.

The switchgear and the earthing switches are operated from the front with the door closed.

The switchgear can be wall-mounted. The range of apparatus available for Unisafe ZS1 switchgear is the most complete on the market, including vacuum and gas circuit-breakers. All this apparatus is interchangeable inside the same switchgear unit. This makes it possible to offer a single switchgearuser interface, with the same service and maintenance procedures and operations. The switchgear can be fitted with conventional (transformers and releases) or innovative (sensors and multi-purpose unit) measurement and protection components.

Apart from the traditional functional units, the Unisafe ZS1 switchgear is fitted with double buss bar systems. The use of these units allows extremely efficient use of space.

According to the IEC 62271-200, Unisafe switchgear can be defined as follows :

1. LSC-2B

The busbars, circuit-breaker and cable compartments are physically and electrically segregated. This is the category that defines the possibility of accessing the circuit-breaker compartment with the busbars and cables energized.

2. Partition Class

Switchgear providing continuous metallic partitions and shutters, intended to be earthed between opened accessible compartments and live parts of the main circuit. Metallic partitions and shutters or metallic parts of them shall be connected to the earthing point of the switchgear.

3. Interlock-controlled accessible compartment

Compartment containing high-voltage parts, intended to be opened for normal operation and/or normal maintenance, in which access is controlled by the integral design of the switchgear.

4. Tool-based accessible compartment

Compartment containing high-voltage parts, that may be opened, but not for normal operation and maintenance. Special procedures are required. Tools are necessary for opening.

Busbar System

The main and branch bus bars are made of high conductivity 99.9% electrolytic copper from Mesbar Kaveh factory or Bahonar company.

Main bus bars located at the top of cubicles in a separate compartment. Cross section of bus bars is not less than the minimum values recommended by IEC standards for bare buses also all dreading will be applied.

PE & N buses are provided through all cubicles. All busbars will be painted with RED, YELLOW, BLUE color or will be clearly coded in the form of RED, YELLOW, BLUE or L1, L2, L3.

Differing requirements for the busbar system call for individual options. UNIGEAR offers modules for economical setup and high level of safety.

- Busbar position at top or middle
- Buss bar system for rated currents up to 630 A
- User-oriented gradation of rated currents
- Transport unit joints easily accessible from above
- Cross section of N buss bar and PE buss bar, the same size as the main buss bar.

Applications

- Utilities and Power Plants
- Power generation stations
- Transformer stations
- Main and auxiliary switchgear

Industry

- Oil and gas pipelines
- steel & ion
- cooper
- Pulp and Paper
- Cement
- Textiles
- Chemicals
- Food
- Automotive
- Petrochemical
- Quarrying
- Metallurgy
- mills
- Mines

Transport

- Airports
- Ports
- Railways
- Underground transport

Infrastructure

- Shopping malls
- Hospitals
- Large infrastructure and civil works

Degrees of protection

The degrees of protection of the switchgear conform with IEC 60529 Standards.

Unisafe switchgear is normally supplied with the following standard degrees of protection:

- IP4X for the enclosure.
- IP2X for the partition between compartments.

On request, the external housing can be supplied with a higher degree of protection; in this case please contact your ABB sales representative.

Color of the external surfaces

RAL7035 - light grey (front doors).

RAL7032- a pale brown color (front doors).

Other colors available on request.

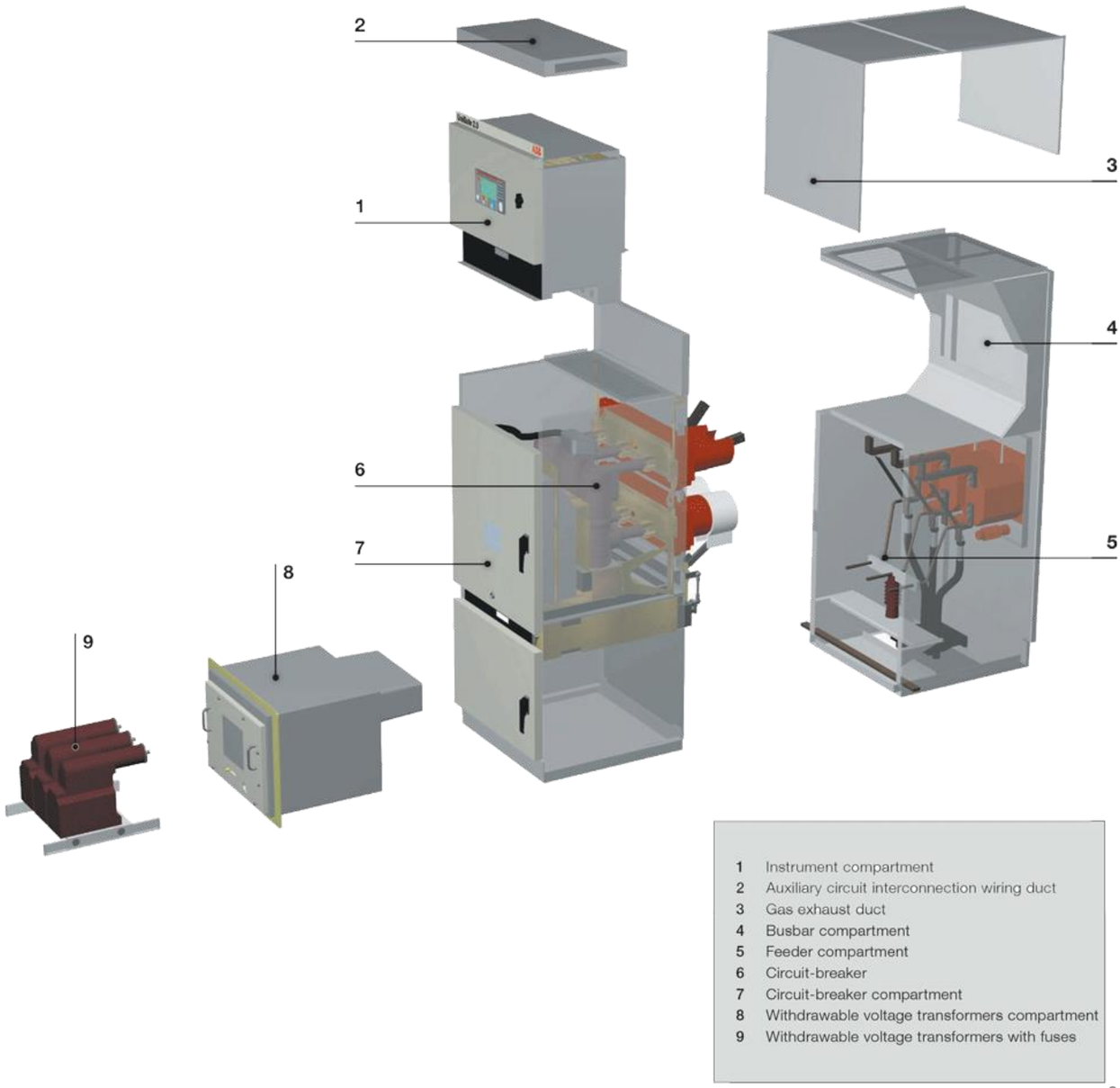
With the release of the IEC 62271-200 standard, new definitions and classifications of Medium Voltage switchgear have been introduced.

One of the most significant changes is that classification of switchgear into metal-clad, compartmented and cubicle types has been abandoned.

The revision of switchgear classification rules has been based on the user's point of view, in particular on aspects like service and maintenance of the switchgear, according to the requirements and expectations for proper management, from installation to dismantling.

In this context, Loss of Service Continuity (LSC) has been selected as a fundamental parameter for the user.

2. Panel design



3

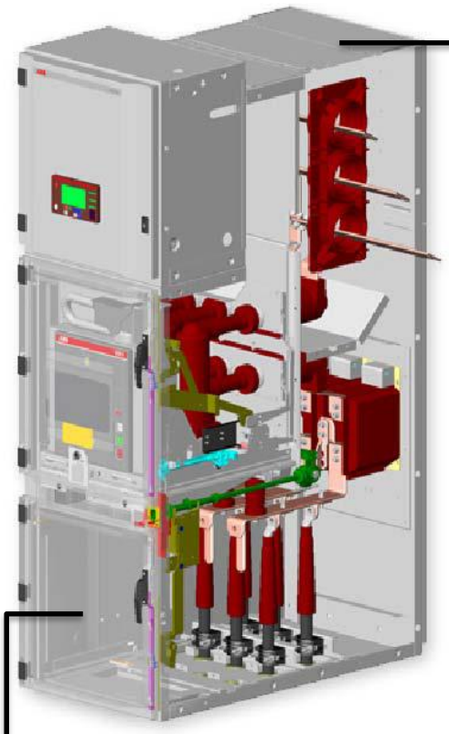
Each Unisafe switchgear consists of a single unit which can be equipped with a circuit-breaker, withdrawable fused device, off load disconnector, as well as with all the accessories available for conventional switchgear units.

The panel incorporates a compartment in its upper level to house the auxiliary instrumentation.

Units can be coupled together directly with double busbar units, with the possibility for further extension on both sides of the switchgear.

The switchgear does not require rear access for installation or maintenance.

All the service operations are carried out from the front.



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Option: Application of overpressure sensors inside the panels

Basic level: auxiliary switches on the pressure release flaps Arc detection within 100ms plus direct CB trip (40-60ms)

3. Runin introduction

Runin Company is the result of a gathering of experts with experience in the fields of executive consulting, design and manufacture of electrical panels, organization and management of various industries and projects. The purpose of this organization is to provide engineering technical services in a wide range of design up to the implementation stage.

Technical and engineering department: This department is engaged in electrical engineering and automation services in industrial projects, design and implementation of energy management systems (PMS) and PDCS and electrical protection systems, design and implementation of electricity distribution and transmission projects.

Production facility: Runin panel factory in Yazd industrial city, with modern machinery and using years of experience under the supervision of experienced and specialized engineers, always tries to improve the quality of its products technically and in accordance with the latest international standards. This company holds the ISO 9001: 2008 quality management certificate from QAL UK.

The area of factory is about 6000 m2 that 4000 m2 of this allocated for assembling of switchgears. Runin Sanat Co. is able to manufacturing 1500 LV and 1000 MV switchgears annually.

4. Metalworking machinery and equipment

Runin's cubicle manufacturing and production department is able to make all kinds of panels with the best quality by using advanced automatic machines. All stages of manufacturing metal parts of the panel are under the supervision and inspection of quality control and try to be made according to customer needs. The blacksmithing department of Runin Company is equipped with CNC machines as follows.

- Punching CNC: AMADA and TRUMPF
- Tru Laser CL3030: TRUMPF
- Press break CNC: HACO
- Sharing CNC: Inanlar
- Notching CNC: Indomach

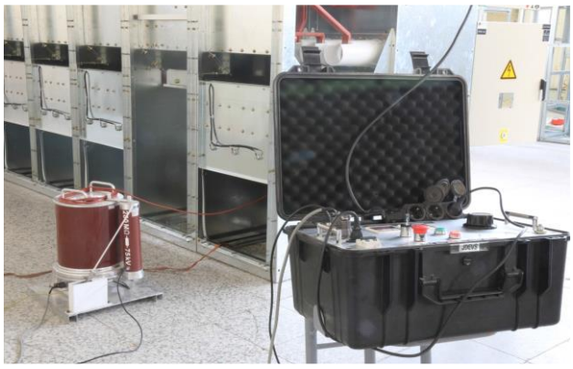
5. Painting

In the coloring section, the activity is divided into the following two categories: Washing and phosphating part Coloring Part in the washing part, first all the parts are lubricated with a degreasing solution and prepared for the washing and phosphating steps. After fiber removal, all the prepared parts are installed on the relevant fence and during a four-step process and immersion, these parts are "zinc" phosphate to a thickness of about 12 microns. Then they are placed inside the cyclone and painted as electrostatic powder and finally baked in the oven.

Due to the importance of color in the electrical panel, Runin company has tested its painted sample in the laboratory, and the results of all tests have been successful.

6. Quality Control

In the quality control unit, in addition to precise control during the process, the panel is also tested and delivered to the customer. According to the type of panel and in accordance with the current world standards, the testing process is performed in the presence of the customer and the relevant test sheets are completed. The quality control unit is equipped with state-of-the-art devices to control during the process and perform various tests on the production board, and all this equipment are calibrated at regular intervals by the competent organs. This equipment includes: 75 kV pot test machine, low pressure pot test machine, 5000 volt Meager machine, thickness gauge machine, current injection machine and etc.



7. Technical Office

Runin Company's technical office, relying on efficient personnel as well as powerful software, is responsible for producing construction drawings, including mechanical drawings and electrical drawings. In this section, and before the project is announced for construction, complete plans are prepared for the customer's approval, as well as the insertion of their requested points, and after final approval, the construction is announced. Finally, this office is responsible for preparing the Finial Book and sending the ticket maps to the customer.

Technical office software:

- Solid Work
- Auto Cad
- ETAP Power Station
- Step7 V5.5
- Eplan Electric P8
- Dialux 4.12
- MS Project
- Circuit Maker

8. Assembly Workshop

Panel assembly part from two main parts:

- Mechanical assembly, which includes the assembly of parts made by the manufacturing and production of skeletons, and mechanical assembly of electrical parts, including switches, contactors, etc.
- Electrical assembly, which includes wiring of power circuits, wiring of control circuits, busbars and additional operations. Composed.

All activities in this section are under the supervision of quality control inspectors and the start of any new process requires quality control approval on the previous process. All the documents in this section, in addition to complying with current world standards, have already been coordinated with the customer so that the customer's technical opinions can be applied in the assembly.

Quality control in this section, in addition to monitoring the proper execution of work, also monitors the values. These values include the size of the busbars, the allowable insulation distances, the size of the power and control circuit wires, the size of the output terminals, and so on.

9. MV Products

Medium voltage switchgears withdrawable:

- UNISAFE type /ABB
- UNIGEAR type / ABB
- SIMOPRIME type / Siemens
- 8BK20 type / Siemens
- 8BK80 type / Siemens
- GIS type / Siemens

10. Standards

#	IEC-Standards	STANDARD APPLICATION DESCRIPTION
1	IEC 60038	Standard Voltage
2	IEC 60059	Current rating
3	IEC 60112	Method for determining the comparative and proof
4	IEC 60044-1	Instrument transformers-part1: current transformers
5	IEC 60044-1	Instrument Transformer
6	IEC 60051	Direct acting indicating analog electrical measuring instruments
7	IEC 60186	Voltage Transformer
8	IEC 60255	Electrical Relays
9	IEC 60269	Low Voltage Fuses
10	IEC 60364	Electrical Installation of Building
11	IEC 60529	Degrees of protection provided by enclosures
12	IEC 60664	Insulation coordination with low voltage system
13	IEC 61000	Electromagnetic compatibility
14	IEC 60445	Identification of equipment terminals and terminations of certain designated conductors including general rules for an alphanumeric system
15	IEC 60521	Class 0.5, 1 and 2 alternating current watt-hour meters
16	IEC 60831	Power Factor Correction Capacitor.

11. List of Origin Manufacturers of MV Switchgears

The following table is the list of acceptable manufacturers in RUNIN but for inform of the manufacturers of proposed equipment please refer to MTO.

this brand there isn't in oil AVL.

Item	Equipment Description	Manufacturer
1	Circuit Breakers (VCB/GCB)	ABB/Hyundai/Fulmen/Pars Switch
2	Load Break Switch (LBS)	ABB/Hyundai/Fulmen/Pars Switch
3	Vacuum Contactor (VC)	ABB/Hyundai/Fulmen/Pars Switch
4	Resin Cast Current Transformer	Mag Electric/Pars Shar/Electro Pejvak
5	Ring Type Current Transformer	Mag Electric/Pars Shar/Electro Pejvak/Novin Harris
6	Resin Cast Voltage Transformer	Mag Electric/Pars Shar/Electro Pejvak
7	Multifunction Protection relay	Siemens/Schneider/ Fanox/PNC
8	discrepancy	Cewe/Fuji
9	Semaphore	Cewe/Fuji
10	Aux. Relay	Finder/Mouller
11	Timer	Finder/Omron/Shiva amvaj
12	Lockout and Trip Relay	Lovato/Fanox Siemens/Schneider/ Fanox/PNC
13	Selector Switch	Raad/TRS /Schneider/Electro Kaveh
14	Miniature Circuit Breaker(MCB)	Schrack/Schneider/LS/Hyundai
15	Test Block	Cewe/Fuji/Hamian Fan
16	Alarm Window	Mabna Niroo
17	Transducer	Ziegler/Rael/Iskra
18	Analog Metering Devices	Ziegler/Rael/BEW
19	Digital Metering Device	Schneider/Socomec/Shiva amvaj
20	Push Button	Raad/Schneider
21	Signaling Lamp	Raad/Schneider
22	Terminal	Raad
23	Disconnectors Switch with Fuse (control)	ETI/Raad
24	Heater	Koomesh
25	Cable & Wire	Shirkooh /Yazd / Setareh
26	Duct & Rail	Raad/Alborz
27	Micro Switch	Sammit/TRS
28	Lighting	Max Light/Mahnoor
29	Thermostat	Sammit/Koomesh
30	Fan	Sammit

12. Scope of Work

Item	Main	Option	Description	Remark
1	*		Design & Engineering & Manufacturing of Switchgears(BPP)	Included
2	*		Factory Acceptance Test & Inspection (FAT)	Included
3		*	Site Acceptance Test & Inspection (SAT)	
4		*	Seaworthy Packing (Wooden)	
5		*	Shipment	
6		*	Site Supervision (Per Day-8 h by local expert) (Man / Day)	
8		*	Training of client personnel at vendor shop or site (3-Man)	
9	*		Final Vendor Data Book Included	
10		*	Relay Coordination & Setting Schedule	
11		*	Cable Gland	
12		*	Sealing End	
13		*	Bus Duct or Bus Bridge	

*BPP: (Bubble plastic Packing)

13. Deviation & Notes List

There were some conflicts between documents so please refer to comments on sheets of MTO and technical observation in attached file No. 1.

14. Existing Document

The subject of proposal is, design, and manufacture, materials & Factory testing of Switchgears according to following description:

#	Document Name	Document Number	Rev
1	Single Line Diagram	07-BK-GCS-PEDCO-120-EL-SL-0003	D04
2	MR FOR Existent MV Switchgear Expansion & RCP	BK-GCS-PEDCO-120-EL-MR-0003	D01
3	Wiring Diagram RCP	14-BK-GCS-PEDCO-120-EL-DG-0005	D01
4	Data Sheets For Capacitor Bank	12-BK-GCS-PEDCO-120-EL-DT-0007	D02
5	Data Sheets For Remote Control Panel	10-BK-GCS-PEDCO-120-EL-DT-0015	D02
6	Data Sheets For Expansion Of Mv Switchgear	09-BK-GCS-PEDCO-120-EL-DT-0004	D03
7	Electrical Typical Schematic Diagram	08-BK-GCS-PEDCO-120-EL-DG-0001	D06

15. List of Switchgears

Design temperature is 52. all the equipment sizing shall be modify according to this temperature.

#	Switchgear Name	Panel Type	Construction	Panel Qty.	SWG Qty.	Total Panel
1	3.3 KV MV SWG	UNISAFE	Withdrawable	2	1	2
2	11KV MV Switchgear	UNISAFE	Withdrawable	10	1	10
3	Cap. Bank 600KVAR	…	FIXED	1	3	1

360 KVAR according to Calculation Attached with PMR.
vendor shall calculate & confirm the purchaser calculation & based on required KVAR, shall proceed to proved capacitor bank.

It shall be 3 instead of 1.

16. List of Spare Part and Accessories

- **MV SWITCHGEAR**

MV SPARE RART
R1402 P 107
MV SWG

#	Description	QTY
1	*2 YEARS SPARE PART*	*1*
2	*COMMISSIONING*	*1*
FEEDER SUM.		**2**

RUNN
Switchgear Manufacturer

LIST OF EQUIPMENTS (MTO)

SWG NAME:	MV SWG
PANEL NAME:	2 YEARS SPARE PART
DWG No.	…
DATE:	30-Oct-23
QTY	1

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R140 2 P 107

2 YEARS SPARE PART

ITEM	EQUIPMENT DESCRIPTION	FEEDER RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	TRIP COIL FOR VCB, 110VDC		2	PARS SWITCH	
2	CLOSE COIL FOR VCB, 110VDC		2	PARS SWITCH	
3	MOTOR CHARGE FOR VCB, 110VDC		2	PARS SWITCH	
4	ANTI-PUMPING FOR VCB		2	PARS SWITCH	
5	VOLTAGE & CURRENT PROTECTION RELAY (FOR INCOMINGS & BUS TIES)		0	N-A	
6	AUX. RELAY		30	WEIDMULLER	
7	MV HRC FUSE FOR MOTOR/TRANSFORMER		0	N-A	
8	MV HRC FUSE FOR VOLTAGE TRANSFORMR (PT)		3	AEG	
9	MCB,2P,DC	4A	9	NOARK/ISKRA	
	MCB,3P,AC	6A	4	NOARK/ISKRA	
10	LV FUSE (DISCONNECTOR SWITCH), 2P	32A	5	ETI/RAAD	
11	CYLIDRICAL FUSE	2-6A	11	ETI/RAAD	
12	LOCKOUT RELAY (86)		2	SIEMENS	
13	SIGNAL LAMP		14	SCHNEIDER	

if you use this brand, you shall submit type test for switchgear.

SALES ENGINEERING DEPT.

Prepared by: …	Checked by:
COMMENT	

RUNN
Switchgear Manufacturer

LIST OF EQUIPMENTS (MTO)

SWG NAME:	MV SWG
PANEL NAME:	COMMISSIONING
DWG No.	…
DATE:	30-Oct-23
QTY	1

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R140 2 P 107

COMMISSIONING

ITEM	EQUIPMENT DESCRIPTION	FEEDER RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	LV FUSE (DISCONNECTOR SWITCH), 2P	32A	5	ETI/RAAD	
2	CYLIDRICAL FUSE	2-6A	11	ETI/RAAD	
3	SIGNAL LAMP		14	SCHNEIDER	

SALES ENGINEERING DEPT.

COMMENT	Prepared by: …	Checked by:

- **MV CAP. BANK**

MV SPARE RART
R1402 P 107
MV Cap. Bank

#	Description	QTY
1	*2 YEARS SPARE PART*	*1*
2	*COMMISSIONING*	*1*
FEEDER SUM.		**2**

RUNN
Switchgear Manufacturer

LIST OF EQUIPMENTS (MTO)

SWG NAME:	MV Cap. Bank
PANEL NAME:	2 YEARS SPARE PART
DWG No.	…
DATE:	30-Oct-23
QTY	1

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R140 2 P 107

2 YEARS SPARE PART

ITEM	EQUIPMENT DESCRIPTION	FEEDER RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	TRIP COIL FOR VCB/VC		0	N-A	
2	CLOSE COIL FOR VCB/VC		0	N-A	
3	MOTOR CHARGE FOR VCB/VC		0	N-A	
4	POWER FACTOR REGULATOR		0	N-A	
5	AUX. RELAY		6	WEIDMULLER	
6	ISOLATING TRANSFORMER		0	N-A	
7	LV CONTACTOR		0	N-A	
8	MCB,2P,AC	4A	3	NOARK/ISKRA	
	MCB,3P,AC	6A	1	NOARK/ISKRA	
9	LV FUSE (DISCONNECTOR SWITCH), 2P	32A	3	ETI/RAAD	
10	CYLIDRICAL FUSE	2-6A	5	ETI/RAAD	
11	SIGNAL LAMP		5	SCHNEIDER	
12	FLUORESCENT LAMP		1	IRAN	

SALES ENGINEERING DEPT.

COMMENT	Prepared by: …	Checked by:

RUNN
Switchgear Manufacturer

LIST OF EQUIPMENTS (MTO)

SWG NAME:	MV Cap. Bank
PANEL NAME:	COMMISSIONING
DWG No.	…
DATE:	30-Oct-23
QTY	1

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R140 2 P 107

COMMISSIONING

ITEM	EQUIPMENT DESCRIPTION	FEEDER RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	LV FUSE (DISCONNECTOR SWITCH), 2P	32A	1	ETI/RAAD	
2	CYLIDRICAL FUSE	2-6A	2	ETI/RAAD	
3	SIGNAL LAMP		5	SCHNEIDER	

SALES ENGINEERING DEPT.

COMMENT	Prepared by: …	Checked by:

- **LV RCP**

LV SPARE RART
R1402 P 107
LV RCP

#	Description	QTY
1	*2 YEARS SPARE PART*	*1*
2	*COMMISSIONING*	*1*
FEEDER SUM.		**2**

RUNN
Switchgear Manufacturer

LIST OF EQUIPMENTS (MTO)

SWG NAME:	LV RCP
PANEL NAME:	2 YEARS SPARE PART
DWG No.	…
DATE:	30-Oct-23
QTY	1

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R140 2 P 107

2 YEARS SPARE PART

ITEM	EQUIPMENT DESCRIPTION	FEEDER RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	LIGHTING		1	MAHNOOR	
2	SPACE HEAHER		1	KOOMESH	
3	DISCONNECTOR SWITCH, 2POLES, WITH FUSE	32/4A	2	RAAD	
4	LAMP SIGNAL		10	Schneider Electric	
5	MICRO SWITCH		1	IRAN	
6	SELECTOR SWITCH		0	N-A	
7	PUSH BUTTON		2	Schneider Electric	
8	ALARM ANNUNCIATOR		0	N-A	
9	AUX. RELAY		0	N-A	

SALES ENGINEERING DEPT.

COMMENT	Prepared by: ……	Checked by:

RUNN
Switchgear Manufacturer

LIST OF EQUIPMENTS (MTO)

SWG NAME:	LV RCP
PANEL NAME:	COMMISSIONING
DWG No.	
DATE:	30-Oct-23
QTY	1

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R140 2 P 107

COMMISSIONING

ITEM	EQUIPMENT DESCRIPTION	FEEDER RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	LIGHTING		1	MAHNOOR	
2	DISCONNECTOR SWITCH, 2POLES, WITH FUSE	32/4A	2	RAAD	
3	LAMP SIGNAL		10	Schneider Electric	
4	AUX. RELAY		0	N-A	

SALES ENGINEERING DEPT.

COMMENT	Prepared by: ……	Checked by:

17. Technical offer for mv switchgear (11KV)

- **Technical Data**

Technical Data

Project Name:	**BINAK OILFIELD DEVELOPMENT GENERAL**	**REV:**	**0.0**
Drawing No.	**BK-GCS-PEDCO-120-EL-SL-0003**	**R1402 P**	**107**
Switchgear Name:	**11KV MV Switchgear**	**Date:**	**10/30/2023**

Characteristic	Description	Rating or Type
	Voltage ratings	
	Rated operating voltage	11 KV
	Operating voltage	11 KV
	Rated frequency	50 Hz
	Site Altitude	<1000 m
	DesignTemperature	40 °C
	Humidity	100 %
	Short-circuit ratings	
	Short-circuit duration	25 KA/1S
	Current ratings	
	Rated normal current of the busbar	1600 A
	Rated normal current of circuit Breaker	630 A
	Power supply ratings	
	Control and prot	110 V DC
	Signaling Voltag	110 V DC
	Lighting and hea	230 V AC
	General data	
	Cubicle Type	WITHDRAWABLE
	Circuit Breaker T	Vacum
	Metal-Enclosed	Yes
	Metal-Clad	Yes
	Type	Pars Switch
	Installation type	Indoor
	Degree of protection	IP 41
	Painting	RAL 7032
	Thickness of steel sheet	2.5 & 3
	Thickness of Painting	One Layer and 80-120 Micron
	Access Type	Front & Rear
	Cable/Busduct entry(inc	Cable/Bottom
	Cable exit(outgoing)	Cable/Bottom
	y Type	Flush mounted/Fixed type
	ication / Type	No/Hardwire
		Yes
	crepancy	Yes
	ostat	Yes
	Lighting	Yes
		Copper
		Thermofit
		Sliver Plated
	AC wire color	Phase: Black Neutral: Blue
	DC wire color	Positive: Red Negative: Green
	CT wire size	2.5 mm²
	PT wire size	1.5 mm²
	Control wire size	1.5 mm²
	Label formatting	White Letters On Black Background
	Wire Standard	IEC 60332-3-21/isiri 607
	Terminal Type	Screw Type
	Packing	
	Packing	According to covering letter

Prepared by: A.Dehghani

IP 42 according to data sheet

According to "Electrical Typical Schematic Diagrams for MV panel", Protective relays & measuring unit shall be equipped with RS 485 to send signals by serial link. Hardwire is not acceptable.

60 to 80 micron according to item 5.1.13 of IPS-M-EL-144 (4)

According to table 9-6 of journal 110, the size of busbar will be 4*80*5. Please specify the method of calculation & considering derating factor?

According to IPS-M-EL-144(4) item 5.2.3, the busbar insulation shall be flame retardant non-hygroscopic & color coded. please revise.

According to IPS-M-EL-144(4) item 5.3.2, the conductor size for CT/Pt shall be 2.5 & 1.5 for control & signal. please check.

- **List of equipment (11KV)**

RUNN
Switchgear Manufacturer

LIST OF FEEDERS
R1402 P 107

ITEM	Description	QTY
1	OUTGOING TYPE C2	3
2	OUTGOING TYPE C3	4
3	OUTGOING TYPE C5	1
4	ADAPTOR	2
TOTAL		10

List of equipment shall be according to AVL. please check. China & India & east of Europe is not acceptable.

RUNIN
Switchgear Manufacturer

LIST OF EQUIP (MTO)

SWG NAME:	11KV MV Switchgear
FEEDER NAME:	OUTGOING TYPE C2
DWG No.	BK-GCS-PEDCO-120-EL-SL-0003
DATE:	30-Oct-23

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R1402 P 107

QTY 3

OUTGOING TYPE C2

for this brand of breker, type test for switchgear shall be submitted.

ITEM	EQUIPMENT DESCRIPTION	RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	VACUUM CIRCUIT BREAKER, WITHDRAWABLE TYPE, 12KV,25KA/1Sec WITH MOTOR CHARGE 110VDC, OPENING COIL, CLOSING COIL, AUX. CONTACT	630A	1	PARS SWITCH	VP4E
2	CAPACITIVE INDICATOR		1	JEBAL ELECTRIC	
3	RESIN CURRENT TRANSFORMER, 2CORE, X=75A,100A	X/1/1A	3	PARS SHAR	CL: 1, 15VA CL: 5P20, 15VA
4	CORE BALANCE TRANSFORMER	60/1A	1	PARS SHAR	CL:1, 2.5VA
5	PORTECTION RELAY ANSI CODE (50,51,51N,50G,74TCS) WITH RS485 SERIAL LINK		1	SCHNEIDER	P3U20
6	LOCKOUT RELAY (86)		1	SIEMENS	7PA2331-1
7	TRIP RELAY (94)		1	SIEMENS	7PA2732-0AA00-1
8	CURRENT TRANSDUCER		1	ZIEGLER	E13
9	VOLTAGE TRANSDUCER		1	ZIEGLER	E13
10	POWER TRANSDUCER		1	ZIEGLER	PROP
11	MULTI POWER METER WITH RS485		1	SCHNEIDER	PM2220
12	AMMETR ANALOG,SIZE 96*96, CL.1.5		3	BEW	
13	TEST BOX		4	FUJI	
14	INDICATOR POSITION (SEMAPHORE)		1	CEWE	PI39
15	SEMAPHORE FOR TEST OR SERVICE		1	CEWE	PI36
16	DISCREPANCY SWITCH		1	COMELECTRIC	DR115
17	CONTROL EQUIPMENT (MCB, P.B ,SIGNAL LAMP, TERMINAL, AUX. RELAY,…)		1	CONTROL EQUIPMENT	
18	CUBICLE: METAL ENCLOSED EARTHING SWITCH	11KV, 25KA/1Sec	1	RUNIN SANAT	UNISAFE

Please consider CL.1 for ammeter.

SALES ENGINEERING DEPT.

Prepared by: A.Dehghani	Checked by:

COMMENT

86T=94

RUNIN
Switchgear Manufacturer

LIST OF EQUIPMENTS (MTO)

SWG NAME:	11KV MV Switchgear
FEEDER NAME:	OUTGOING TYPE C3
DWG No.	BK-GCS-PEDCO-120-EL-SL-0003
DATE:	30-Oct-23
QTY	4

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R1402 P 107

OUTGOING TYPE C3

ITEM	EQUIPMENT DESCRIPTION	RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	VACUUM CIRCUIT BREAKER, WITHDRAWABLE TYPE, 12KV,25KA/1Sec WITH MOTOR CHARGE 110VDC, OPENING COIL, CLOSING COIL, AUX. CONTACT	630A	1	PARS SWITCH	VP4E
2	CAPACITIVE INDICATOR		1	JEBAL ELECTRIC	
3	VOLTAGE TRANSFORMR, 3CORE (11/√3)/(0.1/√3), (11/√3)/(0.1/√3), (11/√3)/(0.1/3)KV		3	PARS SHAR	CL1: 3P, 25VA CL2: 3P, 25VA
4	MV HRC FUSE FOR SWITCH VOLTAGE TRANSFORMR	6A	3	AEG	
5	RESIN CURRENT TRANSFORMER, 3CORE	100/1/1/1A	3	PARS SHAR	CL: 1, 15VA CL: 5P20, 15VA CL: X
6	CORE BALANCE TRANSFORMER	60/1A	1	PARS SHAR	CL:1, 2.5VA
7	PORTECTION RELAY ANSI CODE (50,51,50G,51G,66,51LR,74TCS ,27,46,49,87M,48,49T,50BF) WITH RS485 SERIAL LINK		1	SCHNEIDER	P3M32
8	LOCKOUT RELAY (86)		1	SIEMENS	7PA2331-1
9	CURRENT TRANSDUCER		1	ZIEGLER	E13
10	TEST BOX		5	FUJI	
11	AMMETR ANALOG,SIZE 96*96, CL.1.5		1	BEW	
12	SURGE ARRESTER		3	PARS ARRESTER	PAJ
13	INDICATOR POSITION (SEMAPHORE)		1	CEWE	PI39
14	SEMAPHORE FOR TEST OR SERVICE		1	CEWE	PI36
15	DISCREPANCY		1	COMELECTRIC	DR115
16	CONTROL EQUIPMENT (MCB, P.B ,SIGNAL LAMP, TERMINAL, AUX. RELAY,…)		1	CONTROL EQUIPMENT	
17	CUBICLE: METAL ENCLOSED EARTHING SWITCH	11KV, 25KA/1Sec	1	RUNIN SANAT	UNISAFE

Please consider CL.1 for ammeter.

SALES ENGINEERING DEPT.

Prepared by: M.Golmohammadi	Checked by: M.Eslami

COMMENT

LIST OF EQUIPMENTS (MTO)

SWG NAME:	11KV MV Switchgear
FEEDER NAME:	OUTGOING TYPE C5
DWG No.	BK-GCS-PEDCO-120-EL-SL-0003
DATE:	30-Oct-23
QTY	1

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R1402 P 107

OUTGOING TYPE C5

ITEM	EQUIPMENT DESCRIPTION	RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	VACUUM CIRCUIT BREAKER, WITHDRAWABLE TYPE, 12KV,25KA/1Sec WITH MOTOR CHARGE 110VDC, OPENING COIL, CLOSING COIL, AUX. CONTACT	630A	1	PARS SWITCH	VP4E
2	CAPACITIVE INDICATOR		1	JEBAL ELECTRIC	
3	RESIN CURRENT TRANSFORMER, 2CORE	75/1/1A	3	PARS SHAR	CL: 1, 15VA CL: 5P20, 15VA
4	CORE BALANCE TRANSFORMER	60/1A	1	PARS SHAR	CL:1, 2.5VA
5	PORTECTION RELAY ANSI CODE (50,51,51N,50G,74TCS,64REF) WITH RS485 SERIAL LINK		1	SCHNEIDER	P3U20
6	LOCKOUT RELAY (86)		1	SIEMENS	7PA2331-1
7	TRIP RELAY (94)		1	SIEMENS	7PA2732-0AA00-1
8	CURRENT TRANSDUCER		1	ZIEGLER	E13
9	VOLTAGE TRANSDUCER		1	ZIEGLER	E13
10	POWER TRANSDUCER		1	ZIEGLER	PROP
11	MULTI POWER METER WITH RS485		1	SCHNEIDER	PM2220
12	AMMETR ANALOG,SIZE 96*96, CL.1.5		3	BEW	
13	TEST BOX		5	FUJI	
14	INDICATOR POSITION (SEMAPHORE)		1	CEWE	PI39
15	SEMAPHORE FOR TEST OR SERVICE		1	CEWE	PI36
16	DISCREPANCY SWITCH		1	COMELECTRIC	DR115
17	CONTROL EQUIPMENT (MCB, P.B ,SIGNAL LAMP, TERMINAL, AUX. RELAY,…)		1	CONTROL EQUIPMENT	
18	CUBICLE: METAL ENCLOSED EARTHING SWITCH	11KV, 25KA/1Sec	1	RUNIN SANAT	UNISAFE

Please consider CL.1 for ammeter.

SALES ENGINEERING DEPT.

Prepared by: A.Dehghani	Checked by:

COMMENT

86T=94

LIST OF EQUIPMENTS (MTO)

SWG NAME:	11KV MV Switchgear
FEEDER NAME:	ADAPTOR
DWG No.	BK-GCS-PEDCO-120-EL-SL-0003
DATE:	30-Oct-23
QTY	2

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R1402 P 107

ADAPTOR

ITEM	EQUIPMENT DESCRIPTION	RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	CONTROL EQUIPMENT (MCB, P.B ,SIGNAL LAMP, TERMINAL, AUX. RELAY,…)		1	CONTROL EQUIPMENT	
2	CUBICLE: METAL ENCLOSED	11KV, 25KA/1Sec	1	RUNIN SANAT	UNISAFE

SALES ENGINEERING DEPT.

Prepared by: M.Golmohammadi	Checked by: M.Eslami

COMMENT

18. Technical offer for mv switchgear (3.3kv)

- **Technical Data**

Technical Data

Project Name:	**BINAK OILFIELD DEVELOPMENT GENERAL**	**REV:**	**0.0**
Drawing No.	**BK-GCS-PEDCO-120-EL-SL-0003**	**R1402 P**	**107**
Switchgear Name:	**3.3KV MV Switchgear**	**Date:**	**10/30/2023**

Characteristic	Description	Rating or Type		
	Voltage ratings			
	Rated operating voltage	3.3	KV	
	Operating voltage	3.3	KV	
	Rated frequency	50	Hz	
	Site Altitude	<1000	m	
	DesignTemperature	40	°C	
	Humidity	100	%	
	Short-circuit ratings			
	Short-circuit duration	25	KA/1S	
	Current ratings			
	Rated normal current of the busbar	630	A	
	Rated normal current of circuit Breaker	630	A	
	Power supply ratings (Aux Voltage)			
	Control and protection	110	V DC	
	Signaling Voltage	110	V DC	
	Lighting and heaters , ….	230	V AC	
	General data			
	Cubicle Type	WITHDRAWABLE		
	Circuit Breaker Type	Vacuum		
	Metal-Enclosed	Yes		
	Metal-Clad	Yes		
	Type	Pars Switch		
	Installation type	Indoor		
	Degree of protection	IP 41		
	Painting	RAL 7032		
	Thickness of steel sheet (frame)	2.5 & 3		
	Thickness of Painting	One Layer and 80-120 Micron		
	Access Type	Front & Rear		
	Cable/Busduct entry(incoming)	Cable/Bottom		
	Cable exit(outgoing)	Cable/Bottom		
	Protection Relay Type	Flush mounted/Fixed type		
	Relay Communication / Type	Yes/Modbus		
	Mimic Diagram	Yes		
	Semaphore/Discrepancy	Yes		
	Heater & Thermostat	Yes		
	Micro switch & Lighting	Yes		
	Busbar			
	Material	Copper		
	Insulation	Thermofit		
	Coating	Sliver Plated		
	LV Compartment			
	AC wire color	Phase: Black		Neutral: Blue
	wire color	Positive: Red		Negative: Green
	wire size	2.5	mm^2	
	wire size	1.5	mm^2	
	ntrol wire size	1.5	mm^2	
	el formatting	White Letters On Black Background		
	e Standard	IEC 60332-3-21/isiri 607		
	minal Type	Screw Type		
	Packing	According to covering letter		

Prepared by: A.Dehghani

According to "Electrical Typical Schematic Diagrams for MV panel", Protective relays & measuring unit shall be equipped with RS 485 to send signals by serial link. Hardwire is not acceptable.

According to IPS-M-EL-144(4) item 5.2.3, the busbar insulation shall be flame retardant non-hygroscopic & color coded. please revise.

According to IPS-M-EL-144(4) item 5.3.2, the conductor size for CT/Pt shall be 2.5 & 1.5 for control & signal. please check.

- **List of equipment (3.3KV)**

RUNN
Switchgear Manufacturer

LIST OF FEEDERS
R1402 P 107

ITEM	Description	QTY
1	OUTGOING TYPE C6	1
2	RISER	1
TOTAL		2

LIST OF EQUIPMENTS (MTO)

Switchgear Manufacturer

SWG NAME:	3.3KV MV Switchgear
FEEDER NAME:	OUTGOING TYPE C6
DWG No.	BK-GCS-PEDCO-120-EL-SL-0003
DATE:	30-Oct-23
QTY	1

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R1402 P 107

OUTGOING TYPE C6

ITEM	EQUIPMENT DESCRIPTION	RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	VACUUM CIRCUIT BREAKER, WITHDRAWABLE TYPE, 12KV,25KA/1Sec WITH MOTOR CHARGE 110VDC, OPENING COIL, CLOSING COIL, AUX. CONTACT	630A	1	PARS SWITCH	VP4E
2	CAPACITIVE INDICATOR		1	JEBAL ELECTRIC	
3	VOLTAGE TRANSFORMR, 3CORE (3.3√3)/(0.1/√3), (11/√3)/(0.1/√3), (11/√3)/(0.1/3)KV	$\frac{3.3}{\sqrt{3}}/\frac{0.11}{\sqrt{3}}, \frac{3.3}{\sqrt{3}}/\frac{0.11}{\sqrt{3}}, \frac{3.3}{\sqrt{3}}/\frac{0.11}{\sqrt{3}}$	3	PARS SHAR	CL1: 3P, 25VA CL2: 3P, 25VA
4	MV HRC FUSE FOR SWITCH VOLTAGE TRANSFORMR	A	3	AEG	
5	RESIN CURRENT TRANSFORMER, 2CORE	100/1/1A	3	PARS SHAR	CL: 1, 15VA CL: 5P20, 15VA
6	CORE BALANCE TRANSFORMER	/1A	1	PARS SHAR	CL:1, 2.5VA
7	PORTECTION RELAY ANSI CODE (50,51,50G,6 ,27,46,49,48,38,49T) WITH RS485 SERIAL LINK		1	SCHNEIDER	P3U30
8	LOCKOUT RELAY (86)		1	SIEMENS	7PA2331-1
9	TRIP RELAY (94)		1	SIEMENS	7PA2732-0AA00-1
10	CURRENT TRANSDUCER		1	ZIEGLER	E13
11	TEST BOX		4	FUJI	
12	AMMETR ANALOG,SIZE 96*96, CL.1.5		1	BEW	
13	VOLTMETER, 96*96 WITH V.S	0-6KV	1	BEW / TRS	
14	SURGE ARRESTER		3	PARS ARRESTER	PAJ
15	INDICATOR POSITION (SEMAPHORE)		1	CEWE	PI39
16	SEMAPHORE FOR TEST OR SERVICE		1	CEWE	PI36
17	DISCREPANCY		1	COMELECTRIC	DR115
18	CONTROL EQUIPMENT (MCB, P.B ,SIGNAL LAMP, TERMINAL, AUX. RELAY,…)		1	CONTROL EQUIPMENT	
19	CUBICLE: METAL ENCLOSED EARTHING SWITCH	3.3KV, 25KA/1Sec	1	RUNIN SANAT	UNISAFE

The voltage on busbar is 3.3 KV. please specify the usage of 11/√3.

PT Class shall be CL.1

SALES ENGINEERING DEPT.

Prepared by: M.Golmohammadi	Checked by: M.Eslami

COMMENT

86T=94
49CR=48
49R=49T

LIST OF EQUIPMENTS (MTO)

SWG NAME:	3.3KV MV Switchgear
FEEDER NAME:	RISER
DWG No.	BK-GCS-PEDCO-120-EL-SL-0003
DATE:	30-Oct-23
QTY	1

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R1402 P 107

RISER

ITEM	EQUIPMENT DESCRIPTION	RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	CONTROL EQUIPMENT (MCB, P.B ,SIGNAL LAMP, TERMINAL, AUX. RELAY,…)		1	CONTROL EQUIPMENT	
2	CUBICLE: METAL ENCLOSED	3.3KV, 25KA/1Sec	1	RUNIN SANAT	UNISAFE

SALES ENGINEERING DEPT.

Prepared by: M.Golmohammadi	Checked by: M.Eslami

COMMENT

19. Technical offer for mv switchgear (Cap. Bank)

- **List of equipment (**Cap. Bank**)**

RUNN
Switchgear Manufacturer

LIST OF FEEDERS
R1402 P 107

ITEM	Description	QTY
1	Cap. Bank 600KVAR	3
TOTAL		3

360 KVAR according to calculation on MR.

LIST OF EQUIPMENTS (MTO)

SWG NAME:	MV Cap. Bank
FEEDER NAME:	Cap. Bank 600KVAR
DWG No.	BK-GCS-PEDCO-120-EL-SL-0003
DATE:	30-Oct-23
QTY	3

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R1402 P 107

Cap. Bank 600KVAR

ITEM	EQUIPMENT DESCRIPTION	RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	CAPACITOR UNIT	200KVAR	3	P.K.C	PK200/6.35/EDRI
2	INRUSH CURRENT REACTOR		3	FARA PAYAM	
3	SURGE ARRESTER		3	PARS ARRESTER	PAP
4	MV HRC FUSE		3	AEG	
5	INSULATOR		12	IRAN	
6	CONTROL EQUIPMENT (MCB, P.B ,SIGNAL LAMP, TERMINAL, AUX. RELAY,…)		1	CONTROL EQUIPMENT	
7	CUBICLE: METAL ENCLOSED		1	RUNIN SANAT	

SALES ENGINEERING DEPT.

Prepared by: M.Golmohammadi	Checked by: M.Eslami

COMMENT

20. Technical offer for lv switchgear (LV RCP)

- **List of equipment (LV RCP)**

List OF LV Switchgears
R1402 P 107

Item	Description	Panel Type	SWG. QTY
1	RCP	Wall Mounted	1
	TOTAL		**1**

RUNIN
Switchgear Manufacturer

List OF Equipmens (MTO)

Rev:	0	SWG. NUMBER :	1
DATE:	10/30/2023	SWG. QUANTITY:	1
PRO. No:R1402 P:	107	SWG NAME:	RCP

PROJECT NAME:	BINAK OILFIELD DEVELOPMENT GENERAL

ردیف	EQUIPMENT DESCRIPTION	RATING	MANUFACTURER ORIGIN	TYPE	
1	PUSH BUTTON		Schneider Electric		10
2	LAMP SIGNAL		Schneider Electric		20
3	DISCONNECTOR SWITCH, 2POLES, WITH FUSE	32A	RAAD		2
4	RESIDUAL CURRENT BREAKING OVER(RCBO), 2P, B CURVE, iDPN N Vigi30 mA	32A	Schneider Electric	A9D31625	1
5	TERMINAL		RAAD		45
6	Wall Mounted, IP42, with heater & lighting		RUNIN SANAT		1

COMMENT	SALES ENGINEERING DEPT.		
	Prepared by: S.Ghorbani	Checked by:	A.Dehghani

21. Operation Tools

LIST OF EQUIPMENTS (MTO)

SWG NAME:	
FEEDER NAME:	SPECIAL TOOLS
DWG No.	
DATE:	30-Oct-23
QTY	1

PROJECT NAME	PROJECT No:
BINAK OILFIELD DEVELOPMENT GENERAL	R1402 P 107

SPECIAL TOOLS

ITEM	EQUIPMENT DESCRIPTION	RATING	QTY	MANUFACTURER ORIGIN	TYPE
1	ALLEN SPANNER (size **6**)		3		
2	OPERATING LEVER FOR FEEDER/BUSBAR EARTHING SWITCH		1		
3	HAND CRANK FOR CHARGING THE CIRCUIT-BREAKER CLOSING SPRING.		1		
4	HAND CRANK FOR RACKING THE SWITCHING-DEVICE TRUCK		1		
5	DOUBLE-BIT KEY		5		
6	RELAY SOFTWARE :(1 DVD)		1		
7	OPERATION & MOUNTING INSTRUCTION		1		
8	VCB TRUCK		1		
9	CURRENT TEST BOX CABLE		1		
10	VOLTAGE TEST BOX CABLE		1		
11	CONNECTION RELAY CABLE BETWEEN PC & RELAY		1		
12	VASELINE		1		
13	PAINT		1		

SALES ENGINEERING DEPT.

Prepared by: S.Ghorbani	Checked by:

COMMENT

22. References

No.	Description	Project Name	Year
Oil, Gas and Petrochemical			
1	LV Switchgears	Alloy steel plant	2022
2	MV Switchgears	Petro Octane Isatis	2022
3	Main equipment Withdrawable Feeder	Danial Petro Company	2021
4	LV Switchgears	Jondishapur Company	2021
5	Free Standing And Wall Mounted MV Switchgears	South Pars Phase 14 Reservoir Project	2020
6	MV Switchgears	Gore Jask Pump House Jondishapur Company	2020
7	MV Switchgears	Khash Mir Javeh gas pressure boost	2020
8	Lighting and explosion proof MV Switchgears	Tombak service and export port project	2020
9	Withdrawable MV Switchgears	Bandar Abbas Petrochemical-nioo faraz	2019
10	LV Switchgears	Omran Sahel (Kangan)	2019
11	LV Switchgears	Jam Petrochemical	2017
12	control Switchgears	Esfahan Pressure Reducing Station-Part Niroo Company	2015
13	LV & MV Switchgears and MV Compact post	Zahedan Gas Station	2015
14	Fixed MV Switchgears	Orumieh Petrochemical	2014
15	Distribution Switchgears	Yadavaran oil field - Sarir Energy supply Company	2011
16	MV Switchgears	Shazand Arak Refinery-Energy Saze Company	2010
17	development plan Switchgears	Geranol Morvarid Company	2009
18	Design & Construction, AHUP & Lighting	Petroleum Industry Institute	2009
19	MCC Switchgears	Shahid Dolati Karaj Oil depot-Sayber Company	2009
20	Main and subsidiary Distribution Switchgears Generator control panel	Nar Project-Central oil-rich areas-Oil Company	2008
21	Main and subsidiary Distribution Switchgears Generator control panel	Kangan Project-Central oil-rich areas-Oil Company	2008
22	Main and subsidiary Distribution Switchgears Generator control panel	Bandar Abbas Project-Central oil-rich areas-Oil Company	2008
23	Subsidiary Switchgears	Barzin Company- Aria Selool Petrochemical	2007
24	Subsidiary Switchgears	Azarbaiejan Pressure Reducing Station-Aria Petrogaz	2007
25	Subsidiary Switchgears	Aria Selool Petrochemical-Nargan Company	2007
26	MCC Switchgears & Lighting	Aria Petrogaz– Shanol Multi-way station Project	2006
27	Office Complex Switchgears	Vaband Company-Varavi	2006
28	Main and sub-Distribution Switchgears Generator control panel	Plastic Chemical Company	2006
29	Design and Construction, MCC & Lighting	Afra shimi Company	2005
30	MV Switchgear, Main Distribution Switchgears, Capacitor, MCC & Lighting	Production of pressure vessels Company, CNG Sanka in Ghazvin	2004
31	MCC Switchgears	Siri Island oil tanks	2003
Steel Industry			
1	LV & LCB Switchgears	Foolad Mobarakeye Esfahan	2022
2	Lighting & MCC Switchgears	YAZD STEEL MAKING PROJECT	2022
3	LV & LCB Switchgears	Padide Kavosh Iranian	2021
4	LV Switchgears	Melting Iron Complex	2020
5	Lighting & LV Switchgears	Ghaenat Steel Company	2020
6	MV Switchgears	Sepid dasht Steel	2020
7	Lighting Switchgears	South kish Kaveh Steel	2020

8	MV Switchgears	Ghaenat Steel	2020
9	Lighting Switchgears	Rezvan Mine	2020
10	LV Switchgears & Withdrawable MV Switchgears	Miyaneh Steel Company	2019
11	Lighting Switchgears	Fakoor Industry-Gol gohar Steel Project	2018
12	Fixed LV Switchgears & Withdrawable MV Switchgears	Pars Bootil	2017
13	LV Switchgears	Yazd Steel Company	2017
14	LV Switchgears & Withdrawable MV Switchgears	Ardakan Melting Steel Company	2017
15	Fixed LV Switchgears	Ardakan Pelletizing Company	2015
16	Withdrawable LV Switchgears & Withdrawable MV Switchgears	Arfa Steel Company	2014
17	Withdrawable LV Switchgears & Withdrawable MV Switchgears	Yazd Melting Metals Company	2014
18	MV Switchgears (Development plant)	Milad Steel Company	
19	MV Switchgears	Yazd Profile Company	2014
20	LV Switchgears, D-R-I Line	Yazd Steel Company	2014
21	All Main Switchgears	Pars Bootil Company	2014
22	MV Switchgear Motor Drive	Arfa Steel Company	2011
23	Fixed MV Switchgears	Arfa Steel Company	2011
24	Withdrawable MV Switchgears, Capacitor Switchgear, Lighting Switchgears	Ardakan Pelletizing-Fakoor Industry Company	2009
25	Withdrawable MCC Switchgears	Ardakan Pelletizing-Fakoor Industry Company	2009
26	Design and construction Capacitor Bank Switchgears & Lighting Switchgears	Yazd Steel Company	2006
27	MV Switchgear With Vacuum Contactor	Esfahan Melting Iron	2005
28	Lighting Switchgears	Yazd Alloy Steel	2004
Mine Projects			
1	LV Switchgears	Daralou Copper Concentration	2022
2	LV Switchgears	Mining Company Maadanjou- Tabas	2021
3	MV Switchgears	Chadormaloo Industrial and Mining Company	2021
4	LV Switchgears	Development and processing of iron Tange Zagh Company	2021
5	LV Switchgears	Tange Zagh-Dr Dehghan	2021
6	(LCB & MV\LV\VFD Panel) Switchgears	Ronak Company (Esmalon Project)	2021
7	LV & LCB Switchgears	Mining and dam construction company(Aria Jonoub Iranian)-Zarand concentrate plant optimization project	2021
8	LV Switchgears	Nipek Copper Industry	2020
9	Control Panel HMI	Iran National Copper Industries Company	2020
10	LV Switchgears	Esmalon Iron ore Complex	2020
11	LV Switchgears, MV Switchgears & Lighting	Tange zagh Iron ore Complex	2020
12	Compact Post	Chadormaloo	2020
13	Withdrawable LV Switchgears (Sivacon)	Copper Mines Complex & Copper processing (Maskani naein)	2014
14	Withdrawable MV Switchgears (Unisafe)	Copper Mines Complex & Copper processing (Maskani naein)	2014
15	MCC Switchgears	Chadormaloo Wastewater treatment plant Project,Fakoor Industry Company	2012
16	Sub-Distribution Switchgears	Zarand Project (ZISCO), Fakoor Industry Company	2012
17	Sub-Distribution Switchgears	Sirjan Project (SISCO), Fakoor Industry Company	2012
18	Emergency Switchgears	Chadormaloo Mines Company	2009
19	Withdrawable MCC Switchgears	Sayber Company- Mineral processing	2009
20	LV Switchgears	Choghart Mine development plan (Itook Iran)	2008
21	Withdrawable LV Switchgears & Withdrawable 6.6 KV Switchgears	Tabas Coal Mines	2007
22	Lighting Switchgears	Bafgh Iron Stone Mine	2007
23	Lighting and Distribution Switchgears	Sechahoun Mines	2007
Road and construction industry			

1	LV Switchgears	Khatamolanbia Construction Camp-Shahid Rajaei Institute	2021
2	LV Switchgears	Vezva Company	2021
3	LV Switchgears	Pars Fara GAM Company	2021
4	LV & MV Switchgears	Rah-e Yab Melal Consulting Engineers Company-Tehran-Shomal freeway	2021
5	Installation and assembly of RC filters and surge arresters	Toos Asfalt Company	2021
6	LV & MV Switchgears	Tehran-Shomal freeway-Alborz Tunnel	2020
7	LV Switchgears	Iran Mal Complex	2020
8	Free Standing And Wall Mounted LV Switchgears	Kermanshah Science and Technology Park	2020
9	LV Switchgears	Vezva Company-Shahre Aftab Multipurpose hall	2018
10	LV Switchgears	Vezva Company-Shahre Aftab -Sport Complex	2017
11	LV Switchgears	Sepanta Naghshe Parse(Ava Center Commercial Building)	2017
Power and Water Industry			
1	LV Switchgears	Energy Satrap Iranian Company	2021
2	LV Switchgears	Isfahan Electrical Repair Company	2021
3	LV Switchgears & Fixed MV Switchgears	Tabriz CHP Powerhouses- Energy Services Company	2019
4	Fix MV Switchgears	Persia Power Plant	2017
5	Fix LV and MV Switchgears	Pouyan Afzar Power Plant	2017
6	LV Switchgears and Compact post	East Persia Power Plant	2016
7	Compact post	Kerman Power Plant (Sinaco)	2016
8	Compact post	Ardakan Power Plant	2016
9	LV Switchgears	Abbas Abad Power Plant	2016
10	Control Switchgears for Generators	Sirjan Power Plant (Sinaco)	2014
11	Control Switchgears for Generators	Mashhad Power Plant	2015
12	Intelligent Switchgears	Yazd and Kerman Power Distribution Company	2015
13	Control Switchgears for Generators	Saough Power Plant	2014
14	MV Switchgears (20 KV)	Industrial Zoon Power Plant	2014
15	MCC LV Switchgears	Water Transfer of Arfah Steel Company	2014
16	MV Switchgears (20 KV)	Yazd Cable and Wire Company	2014
17	Fix LV Switchgears	Jamper Company	2014
18	Control Switchgears for Generators	Zarand Power Plant (Sinaco)	2013
19	MV Switchgears (20 KV)	Yazd Water Transfer Plant	2013
20	MV Switchgears (20 KV)	East Persai Energy Producing Company	2011
21	MCC Switchgears With Drive & Soft Starter & Plc	Yazd Steel Company Water supply of production line and rolling	2011
22	Distribution Switchgears (1600A)	Jamper Co Karaj Mapna	2011
23	Junction Box Switchgear, Distribution Switchgears (3200A)& 20KV Switchgear	Kia Gostaresh Sanaat, West Tehran Water and Sewerage Company	2009
24	Masjed Soleyman Dam Sub Tunnel Switchgears	Masjed Soleyman Dam-Sayber Company	2009
25	Sub & Main & Lighting Switchgears	Earthy Dam koohban-Yazd Soil & Water Company	2008
26	MCC switchgears	Shahzand Power plant water supply	2003
27	Soft Starter Switchgears (75 KV)	Kish Power and Water	2002
Tile and Ceramic Industry			
1	PLC Switchgears	Shirkooh Tile Company	2016
2	Lighting and Main Distribution Switchgears	Yazd Azarin Stone Company	2015
3	Lighting , LV and MV Switchgears	Khatereh Tile Company	2015
4	MV Switchgears	Ifa Ceram Company	2015
5	Control Switchgears	Khatereh Kavir Tile Company	2014
6	LV Switchgears (Development Plant)	Ifa Ceram Company	2014
7	MV Switchgears, Main Distribution Switchgears & Capacitor Bank	Shirkooh Tile Company	2010
8	MV Switchgears, Main Distribution Switchgears & Capacitor Bank	Civil Yazd baft Company	2010

9	Participation in construction of All Complex Switchgears	Faraz Control-Perspolis Tile Company	2010
10	MV Switchgears, Main Distribution Switchgears & Capacitor Bank	Sofal Bam Tile	2009
11	All Development plan switchgears	Yazd Tile Company Development plan	2009
12	Design and construction Of All Complex Switchgears	Pars stone industries Company	2007
13	Design and construction of post 2 MV Switchgear	Yazd Tile Company Development plan	2005
14	Design and construction of Line Control Switchgear- Distribution Switchgears- Capacitor Bank	Sara Loab Meybod Company	2005
15	Loab Meybod Company	Mina Loab Meybod Company	2005
16	Design and construction Of All Complex Switchgears	Omid Loab Meybod Company	2005
17	Design and construction Of Distribution Switchgears(2000A)	Orchin Meybod Tile Company Development plan	2004
18	Design and construction of Line Control Switchgear- Distribution Switchgears- Capacitor Bank	Loab Isatis Company	2004
19	Design and construction of Line Control Switchgear- Distribution Switchgears- Capacitor Bank	Aftab neshan Meybod Company	2003
20	Design and construction of Line Control Switchgear- Distribution Switchgears- Capacitor Bank	Granite Ariya Company	2002
Textile industry			
1	LV Switchgears & Compcat Post	Zarrin Tex Company	2016
2	LV & MV Switchgears, Capacitor Bank	Alyaf Gostar Company	2014
3	Design and construction of Development plan Switchgears	Kavir Semnan Company	2010
4	Design and construction of MV Switchgears, MCC & Distribution Switchgears	Gohar Chap Company	2010
5	Design and construction of MV Switchgears, MCC & Distribution Switchgears	Pars thread Company	2008
Food industry			
1	LV Switchgears	Kale Tehran (Sooliko)	2021
2	LV Switchgears	Kale Tehran	2020
3	LV & MV Switchgears, Capacitor Bank	Kadbanoo Company-Delpazir	2012
4	Distribution Switchgears of Main & Sub Capacitor Bank Switchgears & Control Switchgears for Generators	Food industry (Derajhe)	2009
5	Main Distribution Switchgears, Capacitor Bank Switchgear, Post 20 KV	Chabahar Oil factory- Free trade zone	2009
6	Distribution Switchgears of Main & Sub Capacitor Bank Switchgears	Firoozkooh Starch and glucose	2007
7	Distribution Switchgears of Main & Sub Capacitor Bank Switchgears & Control Switchgears for Generators	Shahrood concentrate	2007
8	Design and construction Of Capacitor Bank Switchgears & Main Distribution Switchgears	Yazd Silo and Grain Administration	2002
Hospital			
1	LV Switchgears	Golestan Hospital	2016
2	LV Switchgears	Navy Hospital (Abnieh Gostar Company)	2016
3	Lighting , LV and MV Switchgears	Minab Hospital	2014
4	LV and MV Switchgears	Bahman Hospital	2014
5	HVAC and MCC Switchgears	Bandar Abbas Hospital	2010
6	MCC and Distribution Switchgears	Kish Hospital	2009
7	Lighting , LV and MV Switchgears	Bandar Abbas Food and Medicine Company	2009
Airport			
1	LV Switchgears (1&2 Transit Saloon)	Kish Airport	2009
2	HVAC and MCC Switchgears	Kish Airport	2006
3	Lighting , Distribution and LV Switchgear	Next Building of Imam Airport	2005
Other Industry			

1	LV Switchgears	Quality test research company	2021
2	LV Switchgears	Quality test company	2021
3	Wall mounted Frame	Safir Company	2021
4	LV Switchgears	Quality test research company	2021
5	LV Switchgears	Borna Rad - Dynamic Engineering and Technology Development Company	2021
6	LV Switchgears	Abnieh Gostar Company	2021
7	LV Switchgears	Infrastructure and equipment of the Refah bank data center	2020
8	LV Switchgears	Sahand Data Center	2020
9	LV Switchgears	Tehran Electricity Distribution Company Data Center	2020
10	Wall mounted LV Switchgears	Iran National Copper Industries-Nipek Company	2020
11	LV Switchgears	Bojnoord Kimiadaran Ammonium sulfate	2020
12	Distribution & Lighting Switchgears	Tehran-Shomal freeway-Pars Faragam Company	2019
13	VFD Switchgears	Tehran-Shomal freeway-Pars Faragam Company	2019
14	MV Switchgears	Shahid Rajaei wharf-Niroo Faraz Company	2019
15	LV Switchgears	Tehran Metro Line 6 (Ahab)	2017
16	LV Switchgears	Tehran Metro Line 7 (Sub Niroo)	2017
17	MV Switchgears	Niroo Koler Company	2017
18	LV Switchgears	Khuzestan Aluminum Company	2017
19	LV Switchgears	Niroo Koler Company	2016
20	Control and MCC Switchgears	Bandar Abbas Ship Manufacturing	2014
21	PLC Switchgears	Bandar Abbas Ship Manufacturing	2014
22	Distribution Switchgears	Piping Line Company	2014
23	MV Switchgears (20 KV)	Isatis Fadak Paper Company	2014
24	MV Switchgears (UniSafe)	Ardakan Glass Company	2014
25	Main Distribution and Capacitor Bank Switchgears	Iran Kavosh Polymer Pipe Company	2011
26	Capacitor Bank Switchgears	Palayesh Niroo Company	2011

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POWER FOR EVER

- Annex

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