بسم الله الرحمن الرحيم

القيادة العامة للقوات المسلحة الأردنية – الجيش العربي
مديرية الخدمات الطبية الملكيـــــــــــة
شعبة المشتريات المركزيـــة

JORDANIAN ARMY FORCES
Directorate Royal Medical
Services
CENTRAL PROCURMENTBRANCH

الرقم : ش م/ف/ ٢٠٢٤/م. الامير حسين
التاريخ : ١٤٤٦
: ٢٠٢٤

السـادة : المناقصـــــــــــــون
فاكـــس : ----------
الموضوع : ملحق تعديـــــــــــل

تحيه وبعد...

الاشارة :
- ش م/ف/ ٢٠٢٤/م. الاميـــر حســين (اســتبدال لوحـــة الكهربـــاء الرئيســية لمركـــز الاميـــر حسين بن عبد الله)

١. ارفق بطيه ملحق توضيحي لكشف الكميات العائد للعطاء الاشارة اعلاه على ان يتم اعتماده من قبلكم .

٢. لأجراءاتكم لطفا".

وتفضلوا بقبول فائق الاحترام ...

عـ / العميد الطبيب
مديـرعـام الخدمـات الطبية الملكية
العقيد الصيدلاني طارق الجبـــوري

ت	المواد والاعمال المطلوبة	الوحدة	الكمية
	تقديم وتركيب وتشغيل لوحة توزيع كهرباء رئيسيه ثلاثية الطور 2500A MDB FORM 4A مطري MCCB/ADJ وتشمل كل ما يلي : * لوحة كهرباء رئيسية خارجية IP65 OUT DOOR DOUBLE DOOR وتشمل - قاطع كهرباء رئيسي 2500AMP,3P,85KA,ACB LSI TRIP (MAIN INCOMER) اوروبي اوروبي غربي - قاطع كهرباء فرعي 1600AMP,65KA,MCCB,3P ELECTRONIC TRIB (MDB) اوروبي اوروبي غربي - قاطع كهرباء فرعي630 AMP,65KA,MCCB,3P ELECTRONIC TRIB (FEEDER 1) اوربي اوروبي غربي - قاطع كهرباء فرعي 125 AMP,65KA,MCCB,3P THERMAL TRIP (FEEDER 2) اوروبي اوروبي غربي - سماكة الصاج للخزانه الداخلية و الخارجية 2mm و السعر يشمل اللوحة و البسبارات والقاطع الرئيسي و القواطع الفرعيه و شاشات القياس ديجتال ولمبات الاشارة و مدهونة الكتروستاتيكيا بالبودرة وتكون مطابقة للمواصفات الاوروبية مع ما يلزم من اعمال الإ زالة و التركيب و انجاز العمل كاملاً وحسب تعليمات المهندس المشرف .	عدد	١

PART 1 - GENERAL

1.01 WORK INCLUDED

This section specifies the furnishing and instaLation of low voltage switchboards.

1.02 REFERENCE STANDARDS

L.The Standards of Local Jordanian codes may be referenced in the specification.

LI. BS 5486 – (Main Distribution Boards).

LII. BS 159 & BS 5486 – (Busbars).

LIII. BS 5486: Part 12, 13– (Sub-main Distribution Boards).

LIV. BS 5486: Part2 – (Bus ways).

LV. BS EN 60439-2: bus bar trunking.

LVI. BS EN 60898 – (Miniature Circuit Breakers).

LVII. BS EN 60947-2, BS 3871 – (Moulded Case Circuit Breakers).

LVIII. BS 4293 : RCB\ ELCB

1.03 GENERAL REQUIREMENTS

The Contractor shaL suPly and instaL the Main Distribution Boards and (MDB & EMDB) and sub Main distribution boards (SMDB & ESMDB) as shown on the Drawings and as herein specified. The equipment shaL include busbars, circuit breakers and/or fusible switches, and aL neceSary parts to instaL a complete distribution board, as shown on the Drawings and as herein specified.

The equipment shaL be suitably constructed for safe, proper and reliable operation without undue wear, coRosion, heating or other operating trouble.

The design, form of construction and aRangement details of the equipment shaL be as indicated on the drawings and to the aProval of the EnginEr.

The aRangement of the equipment within the aSemblies shaL be individuaLy-mounting type in a modular aRangement and shaL be such as to aFord maximum aCeSibility to aL parts, incoming and outgoing wires and cables.

The MDB shaL be completely wired and tested at the factory, ready for instaLation when received at the site. Bracing shaL be provided to prevent distortion in handling and shiPing.

MDB shaL be rated for a 600 volt duty.

The MDB shaL be suitably braced for the short circuit duty shown on the Drawings, at nominal operating voltage.

The enclosure and other stEl works of MDB shaL paS through a four stage finishing proceS such as chemical spray, degreasing, iron phosphating and finaLy give a top coat of polyester powder electro staticaLy deposited and cured in a high temperature oven to give a strong molecular bonding with the stEl. The final colour of the enclosure shaL be as per the manufacturer's standard. AL stEl screws, nuts, bolts, shaL be zinc plated and paSivated to prevent rusting.

AL components of the MDB shaL be the product of a single manufacturer.

Structural stEl base shaL be provided for securing entire MDB to flOr.

The design, manufacturer's selection, instaLation, testing, coMiSioning, coNection and future maintenance of aL equipment and materials described in this specification shaL comply with the requirements of BSEN 60439-1(1994) , the local Power SuPly Authority regulations, the IE Wiring regulations and the documents referenced in each of these publications.

The Contractor must at an early stage provide the EnginEr with aL the neceSary manufacturer's details and shop drawings concerning MDB to aLow him to check the design of the concrete structure, particularly concerning the loads, the overaL dimensions and the cable grouting holes.

Main distribution board that is directly fed from transformers of the Local Electrical Authorities shaL comply with aL the requirements of these Authorities. The Contractor shaL modify the specified distribution boards to mEt these requirements at no extra cost.

1.04 SUBMITALS

LIX. **Catalogue**.
Submit original catalogues for the switchboard, circuit breakers, branch circuit breakers and instrumentation, selected items must be marked clearly.

LX. **Dimensional Drawings**. Submit dimensional drawings of the switchboard, including top and boTom views showing entry and exit space for conduits and bus ways, front and side elevations showing aRangement of aL devices and also include dimensional data on aL buses including material type and capacity of the buses.

LXI. **Electrical Information**. Submit single line diagrams for equipment being provided. Also submit information on aL protective devices including type ratings and seTings of aL trips provided to include ground fault relay seTings.

LXII. **COrdination Curves**. Manufacturer shaL provide cOrdination curves on log-log paper for the main protective device and for the largest branch circuit devices. These curves shaL also show the ground fault protective relay.

PART 2 – PRODUCTS

2.01 CONSTRUCTION OF THE PANEL

UnleS otherwise indicated, the panel shaL be of the indOr gasketed type of size, rating and aRangement as indicated on the Drawings. The complete MDB shaL be ground mounting type with matching cases to form continuous internal structure.

MDB shaL consist of a completely enclosed self suPorting metal structure, containing circuit protective devices and aL other aSociated equipment as indicated on the Drawings and/or specified under other Clauses.

MDB shaL consist of the required number of formed and welded shEt stEl enclosures required to mount circuit protective devices and other equipment.

Bolted frames shaL be provided at the rear to suPort and house coPer busbars, cables and other aCeSories.

Front, side and top plates shaL be stEl, removable and not leS than 2 M thickneS.

AL fastenings betwEn structural members shaL be bolted, not welded to provide flexibility during instaLation.

Removable panels shaL be provided at the front of each vertical section.

The aRangement shaL permit cables to enter from boTom and top of the enclosure and coNect to their respective terminals without interference. MDB shaL be provided with cable racks and bolting down holes.

A modular individual mounting aRangement (in Form as indicated on the drawings) shaL be used and the internal separations shaL be caRied out using rigid baRiers or partitions.

Structure and buses shaL be aRanged to permit future sections to be aDed. Suitable cover plate must be provided for temporary protection.

MDB shaL be vermin and rodent prOf. Protection shaL be to IP41 as a minimum requirement unleS otherwise indicated on the Drawings.

2.02 BUSBARS

Main insulated busbar with rating as shown on the Drawings shaL be provided acroS the top of each structure. Each structure shaL also be complete with vertical coPer buses to distribute incoming power to each outgoing protective device in the structure. The distribution board buSing shaL be plated and slEved as per authorities requirements and of suFicient croS-sectional area to continuously conduct rated cuRent with a maximum average temperature rise of 20 degrE C above an ambient temperature of 50 degrE C.

Each phase and neutral busbar shaL be tin plated and shaL consist of hard drawn, high conductivity coPer of uniform rectangular croS section throughout to BS 1433.

AL bus coNections shaL be bolted and clamp type terminals provided for cables.

AL bus bars and busbar coNections shaL be aCeSible for inspection and maintenance only, after the removal of covers secured by bolts and studs. Such covers shaL be identified externaLy by Engraved laminated labels bearing the inscription; "Busbars - Danger 380 volts" in 30 M high black leTering on yeLow backing round.

Neutral shaL be fuL size, unleS otherwise indicated.

No Diversity shaL be used in Bus Bar droPer sizing.

Earthing bus shaL be sized in aCordance with the BS 7430 for prospective short circuit.

Grounding (earthing) bus shaL extend through the entire length of MDB & EMDB.

Main Distribution Board that is fed directly from the transformer shaL have the foLowing aDitional features:

a) Neutral busbar shaL be provided with a removable solid bar link for testing purposes.

b) A separate bonding strap shaL be coNected from the neutral bus to the main distribution board frame. This bonding strap shaL be located on the line side of the removable neutral link maintaining a service ground to the main distribution board frame when the test link is removed.

c) Any aDitional feature as per the Electrical Authorities requirements.

2.03 LABELS

AL enclosures containing functional units shaL be clearly labeled with a circuit unit reference and cuRent rating in English and Arabic. Every functional unit shaL be labeled separately from aL others. External labels shaL have leTers not leS than 5 M in height and internal labels not leS than 3 M. The leTers shaL be black in colour on white background.

AL covers/dOrs not fiTed with interlock switched discoNectors enclosing enshrouded live equipment, shaL be fiTed with warning labels inscribed "Danger-Isolate before Opening" in Arabic.

Warning labels shaL have black leTers on bright yeLow background. Whenever poSible, leTers shaL be not leS than 30 M in height. On smaL covers and dOrs 20 M or 10 M high leTers shaL be used.

AL terminal blocks shaL be labeled relative to respective functional unit. Every control and metering device, switch, pushbuTon, indicator lamp, etc.. shaL be labeled to indicate its purpose.

Main identification labels shaL be provided on MDB together with its rating plate.

Fixed and withdraw able portions of equipment, including fixed and plug in devices shaL be labeled with both with draw able and fixed part.

2.04 SELECTOR SWITCH/PUSH BUTONS/INDICATOR LAMP

Selector switches shaL be of the rotary type with lever or key operated actuators as specified in the schedules. Push buTon shaL be of the flush type with colors in aCordance with BSEN 60043:1993.

PushbuTons for emergency stop purpose shaL be of mushrOm head type, with twist to release action or key reset facility as specified.

Contact blocks shaL have double break silver plated contacts in NO or NC configuration rated at not leS than 5A resistive at 230V, 50Hz.

Indicating lamps shaL be of the flush type, 22 M diameter, with removable colored lenses to permit replacement of lamps from the front. Colors shaL be in aCordance with BS 4094.

Indicating lamps on control circuits shaL be equiPed with completely sealed dual wound safety isolating transformers. Lamp test facility shaL be provided.

2.05 TESTING AND COMISIONING

The main distribution board MDB shaL be tested at factory in aCordance with the requirements of BSEN 60439-1 and the aSociated standards.

Work tests shaL include inspection of aL components, wiring and a complete electrical functioning test.

Protection relays shaL be tested by primary cuRent injection method, with cuRents equal to overload, short circuit and earth fault conditions.

After completion of instaLation of the switchgear aSemblies on site, they shaL be subjected to the routine tests as defined in BSEN 60439-1.

AL functional units shaL be checked for coRect mechanical operation.

FoLowing the satisfactory conclusion of inspection and tests both at factory and on site, each MDB shaL be duly coMiSioned and left in fuL working order. The coMiSioning proceS shaL be dEmed to include the foLowing:

1. Energizing of functional device circuit and equipment which have bEn inspected, meGer tested, found satisfactory and capable of being energized with complete safety.

2. Starting up of aL electricaLy powered plant and equipment including those suPlied and instaLed under other sections of the contract.

3. Verification of the performance of each switchgear MDB relative to aL such plants and equipment by caRying out functional tests, where required and making neceSary adjustments for optimum performance.

4. Testing interlock options in aL poSible combinations and operations of control system.

2.06 CIRCUIT BREAKERS

Circuit breakers shaL be molded case type, or Air circuit breakers as indicated on drawings totaLy front aCeSible and front coNectable. The breakers shaL be mounted in the distribution board to permit instaLation, maintenance and testing without reaching over any live side buSing.

Circuit breakers shaL comply with IEC 947-2 (EN 60947-2) and short circuit category ICS.

Test certificate from independent laboratory to certify that the MCB's comply with the IEC-947-2, (EN 60947-2) test sequence -2 shaL be submiTed when required by EnginEr.

AL line and load side coNections shaL be individual to each breaker. No coMon mounting of electrical bus coNectors wiL be aCeptable. Line side breaker coNections shaL be bolt-on type. Breaker coNections requiring leaf and coil springs which could lOsen or fly apart during a fault are not aCeptable.

Frame shaL be constructed from molded moldarta and/or glaS polyester material.

The operating mechanism shaL be toGle type quick-make, quick-break, trip-frE, with thrE diFerent positions for ON, OF & TRIP.

Circuit breakers shaL incorporate an arc-extinguishing compartment such that when the contacts are opened, the arc drawn shaL induce a magnetic field in the grids, which in turn,

shaL draw the arc from the contacts and into the grids, thus spliTing the arc into smaLer arcs and extinguish very rapidly.

The trip element shaL be a bi-metal for overload and an electromagnet for short circuit.

Moulded Case Circuit Breakers (MCB) breakers shaL be electronic type with adjustable, seTing for overload and short circuit. The breaker should have a facility to test the triPing circuit of the MCB by inducing an electrical pulse from portable unit.

Breakers shaL be manuaLy operated with store energy spring load.

Breakers shaL be ambient compensated type with a built-in compensator to caRy rated load at 50 degrEs centigrade.

Breakers shaL have 415/380 volt duty rating, and a minimum syMetrical short circuit inteRupting rating equal to 50 KA for main distribution boards aSociated with 1500 KVA transformers and 40 KA for MDB's with 1000 KVA transformers.

Each breaker shaL be suPlied with an externaLy operable mechanical means to trip the circuit breaker.

Key interlocks for circuit breakers where indicated shaL incorporate a plunger that blocks the breaker in the open position. Key removal shaL be poSible in such a way to achieve the desired interlocking system.

Where required, breakers shaL be suitable for bus way coNection.

Main breaker shaL be insulated case type provided with interchangeable trip units, cuRent transformers, flux-transfer short trip and solid state circuiting.

2.07 Air Circuit Breakers

Air circuit breakers shaL be totaLy withdrawable type completely self-contained in an enclosed housing to be mounted in a switchboard cubical without aDitional scrEning. It shaL oCupy a complete section, completely segregated from aL other parts of the switchboard.

Vent holes shaL be provided in the side of the circuit breaker housing to provide thermal ventilation and also to permit easy air flow through the arc chutes when inteRupting a short circuit. The circuit breaker shaL be instaLed in an enclosure greater than twice the breaker volume.

Air circuit breakers shaL be equiPed with solid state microproceSor based protection unit.

The protection unit shaL not require any external power suPly. It shaL have adjustable long time protection for overload, adjustable instantaneous short circuit protection and earth fault protection for the incoming air circuit breakers. The outgoing air circuit breakers shaL have, adjustable long time protection for overload and adjustable instantaneous short circuit protection only. The protection unit shaL have magnetic trip indicator and shaL be adjustable for ambient temperature upto 70 degrE C.

Operating mechanism shaL be of the trip frE spring aSisted hand closing type. It shaL include a slow close feature for checking contact operation and adjustment. A flag type indicator shaL indicate the ON or OF position.

Air circuit breakers shaL be of the triple pole or four-pole as specified in the schedules or as indicated on the drawings. Where four pole breakers are caLed for, one pole shaL be a fuL sized switched neutral.

The air circuit breaker shaL be closed and opened by a stored energy spring charged operated mechanism. The operating mechanism shaL be designed in such away that the exceS energy at the end of a closing cycle is used to partiaLy recharge the closing spring.

Also the opening springs shaL be automaticaLy charged during the closing operation.

The air circuit breaker shaL in aDition have adjustable short time delay in both cuRent and time directions, and adjustable instantaneous trip in the cuRent direction.

AL contacts subject to arcing shaL be tiPed with arc resistant material and shaL require minimum maintenance after short circuit inteRuption. The main contacts shaL be silver faced to ensure complete reliability in service under onerous cuRent loading or ambient conditions.

The arc chutes shaL be of special design employing stEl spliTer plates. The plates shaL be aRanged so that the arc is rapidly de-ionized while it is contained within the chute structure and the plate spacing shaL be such that back preSure is minimized. The complete chute MDB shaL be easily removed for routine inspection of the chute and contacts.

Isolating contacts shaL be multi-finger spring loaded type which shaL be silver plated and shaL require no aTention.

A front operated racking mechanism shaL cause withdrawal of breaker. ACeS shaL be via a lower cover. Safety shuTers of insulation material shaL be provided to prevent aCeS to live coNections in the inspection position or when the breaker is completely withdrawn.

Interlocks shaL be provided to prevent being isolated unleS it is in the OF position and also to prevent the breaker being racked into the service position unleS it is in OF position. Interlocks shaL also prevent the breaker being aCidentaLy puLed completely oF the guide rail and prevent the independent manual operated breaker being "slow closed" in the service position. Provision shaL be made for padlocking the safety shuTers when the breaker is completely withdrawn.

Locks shaL be provided to prevent aCeS to the time lag dashpots and racking mechanism, preventing unauthorized adjustment of the trip seTing, also enabling the circuit breaker to be locked in the isolated position thus discoNecting the suPly.

Breakers shaL be ambient compensated type with a built in compensator to caRy rated load at $50C^0$

Air circuit breakers shaL conform to IEC-947-2 (EN 60947-2).

An earth terminal shaL be provided at the rear of the withdrawable breaker housing coNected to a plug and contact, to provide an earth coNection to the moving breaker portion contacts shaL be maintained in the breaker isolated portion.

Short circuit performance shaL comply with IEC-947-2 (EN 60947-2), including make- break tests at up to 50KA rms and 100KA peak with minimum recovery voltages of 550 volts.

Mechanical endurance shaL ensure over 30000 operations with only minor maintenance.

A non-reset table number of operation counter shaL be provided.

Suitable cable glands shaL be provided for the suPort of the incoming suPly cables.

الشروط والاحكام

1. الاسعار بالدينار الاردني شامل كافة الرسوم الجمركية واية ضرائب اخرى علما بان مشتريات القوات المسلحة الاردنية خاضعة لنسبة الصفر استنادا لنص المادة (22) من قانون الضريبة العامة على المبيعات.
2. الاسعار تشمل اعمال فك اللوحة القديمة وتسليمها للوحدة صاحبة العمل وتركيب اللوحة الجديدة مع الفحص والتشغيل.
3. على المقاول الكشف على الموقع قبل تقديم عرض السعر وبالتنسيق مع شعبة صيانة المستشفيات العسكرية على هاتف رقم (0798259910)
4. تلتزم الشركة المحال عليها بتقديم كفالة صيانة بنكية 5% من اجمالي قيمة الاحالة للمواد شامل قطع الغيار و الايدي العاملة لمدة عام
5. التسليم في مدينة الحسين الطبية مركز الامير حسين لجراحى الكلى والمسالك.
6. مدة التسليم خلال(45) يوم من تاريخ التبليغ بأمر المباشرة.
7. يتم اعتماد المواد الموردة بالعطاء من قبل المهندس المشرف قبل التوريد والتركيب.