



Kashmir Power Distribution Corporation Ltd.
Office of the Chief Engineer Planning & Procurement,
PDD Complex, Bemina, Srinagar.
 Tel: 0194-2493280, 0194-2493281, Email: ceppkpdcl@gmail.com

TECHNICAL SPECIFICATIONS

OF

433 VOLT, AC DISTRIBUTION PANEL FOR

33/11 kV SUB STATION

Prepared by	Checked by	Checked by	Checked by	Approved by
Er. Javid Ahmad Siddiqui (AEE Procurement) Er. Sheikh Abid (JE)	Er. Manzoor Ahmad Dar (Executive Engineer)	Er. Muzaffar Mukhtar Shah Superintending Engineer, Procurement Circle.	Er. Bashir Ahmad Dar Chief Engineer, Planning & Procurement Wing, KPDCL, Srinagar.	Techno Economic Committee vide No. MD/KPDCL/ TS-1/1920-26 Dated:12/08/2022
Specification No.CE/P&P/SPEC/2022/433 V AC Distribution Panel/015		Date of Issue: 12/08/2022		Rev 0

This Tender Specification for procurement of 433 VOLT, AC Distribution Panel may be subjected to modification by the purchaser as per the actual field requirement. Supplier to submit the Guaranteed Technical Particulars (GTP) and Drawings, after the award of the Contract, for approval of the Purchaser.

CLIMATIC AND ISOCERAUNIC CONDITIONS (CIC)

1.	The climatic and Isoceraunic conditions at the site of work are approximately given as under:																	
	<u>Description</u>	<u>Kashmir</u>																
i)	Max. temp of air in shade	30.6 ⁰ C																
ii)	Min. temp of air in shade	-20 ⁰ C																
iii)	Max. temp of air in sun	45 ⁰ C																
iv)	Height above sea level (App.)	1600 Mtrs.																
v)	Max. relative humidity	90%																
vi)	Min. relative humidity	15%																
vii)	Average no. of thunder storm days per year	54																
viii)	Average rainfall	80 cm																
ix)	Wind Zone	WZ – 3																
x)	Average number of rainy days per year	106																
xi)	Seismic Zone	SZ – 5																
xii)	Area of installation	Heavy Snow Zone																
2.	<p>Communication and Transport:</p> <p>The nearest railway station is Jammu on the broad gauge line and is connected to the Divisional Stores by a metal road. The equipment is required to pass en-route through various tunnels on NH-44 (Nandni, Nashri and Jawahar Tunnel). The weights and maximum dimension of the packages suitable for transportation through tunnel route are as follows:-</p> <table style="margin-left: 40px; border: none;"> <tr> <td style="padding-right: 20px;">1.</td> <td style="padding-right: 20px;">Length</td> <td style="padding-right: 20px;">=</td> <td>7.0 m</td> </tr> <tr> <td>2.</td> <td>Width</td> <td>=</td> <td>3.0 m</td> </tr> <tr> <td>3.</td> <td>Height</td> <td>=</td> <td>4.55 m</td> </tr> <tr> <td>4.</td> <td>Weight</td> <td>=</td> <td>40 metric Ton</td> </tr> </table> <p>The supplier shall get the permissible weight and dimensions confirmed from the Highway Authorities before proceeding with the manufacture of the equipment. It will be the responsibility of the supplier to ensure timely and proper delivery of the equipment on door delivery basis, at Srinagar, through road transport. The supplier shall also ensure that the weights and dimension of the packages which are suitable to be carried by road transport up to Srinagar.</p>		1.	Length	=	7.0 m	2.	Width	=	3.0 m	3.	Height	=	4.55 m	4.	Weight	=	40 metric Ton
1.	Length	=	7.0 m															
2.	Width	=	3.0 m															
3.	Height	=	4.55 m															
4.	Weight	=	40 metric Ton															
3.	Additional conditions																	
i	Permitted Noise Level	45dB																
ii	Induced Electromagnetic disturbance	1.6kV																
iii	Pollution class/ creepage distance	III/ 25mm/kV																
iv	Isoceraunic Level (days/year)	50																
v	Condensation	Occasional																

TECHNICAL SPECIFICATIONS OF 3 PHASE, 4 WIRE, 433 V, 50 Hz A. C. DISTRIBUTION BOARD

1. SCOPE:

- i) This specification covers supply, design, manufacture, assembly, testing at manufacturer's works, packing and delivery of Indoor type A.C Distribution Board for power supply to yard lighting, battery charger, 33 kV/11 kV substation equipment, compressors etc. The system shall be AC 3- Phase, 4 Wire, 433 Volt, 50 HZ with effectively grounded neutral.
- ii) It is not the intent to specify completely herein all details of the design and construction of equipment. However, the equipment shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation up to the Bidder's guarantee in a manner acceptable to the Purchaser, who will interpret the meanings of drawings and specification and shall have the power to reject any work or material which, in his judgment, is not in accordance therewith.
- iii) The equipment offered shall be complete with all components necessary for their effective and trouble free operation. Such components shall be deemed to be within the scope of Bidder's supply irrespective of whether those are specifically brought out in this specification or not.

2. SERVICE CONDITIONS:

Equipment to be supplied against this specification shall be suitable for satisfactory continuous operation under the tropical conditions mentioned above in climatic and isoceraunic conditions.

3. General Nature of Climate:

Moderately hot summers and cold winters with moderate to heavy snowfall and freezing temperatures. The climatic conditions are prone to wide variations in ambient conditions and hence the equipment shall be of suitable design to work satisfactorily under these conditions.

4. STANDARDS:

Unless otherwise specified elsewhere in this specification, the ratings, performance and testing of the ACDB and components mounted on it shall conform to the latest revisions of the following standards :

A	IS: 13947	Degree of protection provided for enclosure for low voltage control gear and switchgear & MCCB
B	IS 5	Painting
C	IS: 13947/1993 Part-III amended up to date	Switch Fuse Disconnecter unit
D	IS 2705 amended up to date	CTs
E	IS 8828/1996 amended upto date	MCB
F	IS 1248	Indicating instruments

G	IS 375	Wiring
H	IS: 13703/1993 Part-I & II	HRC Fuses

5. GENERAL TECHNICAL PARTICULARS:

The A.C Distribution Board shall be supplied as per the following specifications:

5.1 Rated voltage:

Rated voltage for the Distribution Board and its constituent items like Switch Fuse Disconnecter unit, MCBs, busbars etc. shall be 3 phase 4 wire A.C 433 Volt 50 Hz with solidly grounded neutral. The supply voltage may vary by $\pm 10\%$ of rated voltage. All the equipment used in the distribution board shall operate satisfactorily at this voltage variation.

5.2 General requirements:

The general design of ACDB should be as per these specifications.

- a) The Distribution Board shall be floor mounted having compact design. The Board shall be closed, dust protected, weather proof and shall be made vermin proof with a special type lining e.g. Neoprene gasket, around the edges of the doors. The distribution board shall comply degree of protection IP 43. MCBs shall be operating vertically upward for ON/OFF operation & shall be suitable for providing for rectangular bus bar. The entire distribution board shall have uniform finish and shall be sturdy. The distribution boards shall be of modular construction with provision for complete compartmentalization of all feeders. It shall be of dead front type comprising dust-tight and vermin proof sheet steel cabinets suitable for indoor installation. The doors of cabinets shall be lockable. Handle shall be made of reputed make. The DB shall be provided with double door in front having 2 no. hinges (for each door) which should be suitable for movement of 120 degree and 2 no. knobs to be provided on the door corners. All instruments and control devices shall be mounted on the front of cabinets and fully wired to the terminal blocks. All switches provided on the distribution board shall be on front side of the cabinets, operable from outside.
- b) Each Distribution board shall have 2 compartments namely Instruments compartment and Feeder compartment. These compartments shall have doors as described below:
 - b.1) For Instrument compartment, one no. door with indicating instruments, indicating lamps, selector switches, name plate mounted on it.
 - b.2) For feeder compartment, one no. inner door with one opening for handle to operate switch fuse unit and four cutouts for outgoing MCBs. One outer door without cutouts & non-breakable transparent sheet shall be provided.
- c) The AC Distribution Board shall be made out of at least 2.0 mm thick cold rolled steel sheet, suitably reinforced to provide flat level surface. Size 1150 mm (H) x 650 mm (W) x 350 mm (D). Gland plate shall be 3.0 mm thick. No welds, rivets, hinges or bolts shall be visible from outside. The doors shall be fitted with double leaf neoprene rubber gaskets.
- d) All cables shall enter and leave from bottom. Suitable cable terminal blocks with cable lugs, for a minimum of 15 no. circuits, (to be finalized during detailed engineering as per requirement) shall be provided inside each cabinet for the incoming and outgoing cables. The terminals shall be

serially numbered to facilitate installation and maintenance. Main busbars shall be accommodated in busbar chambers and cable alleys arranged by their side. Compression type cable glands shall be provided to hold the cables to avoid any pressure or tension on the terminal block connections. The terminal blocks shall be easily accessible for inspection and checking. Panels shall have cable supports and metallic clips for supporting power and control cables for internal wiring of the panels.

- e) All doors shall be provided with mechanical interlocking arrangements along with keys. The distribution board shall have no door on rear side.
- f) Danger plate (Caution Plate) shall be fitted suitably on inner door of the DB. Danger plate shall be of 100 mm x 100 mm size with details as per KPDCL standard format.
- g) Detachable gland plates suitable for receiving the cable shall be provided at the bottom side of Distribution board with glands.
- h) The ventilating louvers should be covered on inside by a perforated sheet.
- i) All sheet metal used for DB shall undergo seven tank mechanical/ chemical cleaning process & painting shall be done using powder coating process. Colour of the Paint shall be admiral grey as per shade no. 632 of IS 5 on exterior and from interior sides.
- j) The A.C Distribution Board shall be provided with the following equipments wherever applicable:
 - I) One no. name plate showing the details such as manufacturer's name, S.No.,rating etc.
 - II) One no. danger plate scripted in English.
 - III) One no. flush mounted 96 mm x 96 mm size ammeter with selector switch.
 - IV) One no. flush mounted 96 mm x 96 mm size voltmeter with selector switch.
 - V) Outgoing modules with switch/MCB units of adequate capacity for the outgoing feeders.
 - VI) One no. switch fuse disconnecter unit with 200 Amp current rating.
 - VII) 3 no. LED type phase indication lamps for incoming feeder.
 - VIII) 3 no. single phase L.T. CTs of 10 VA and CT ratio 200/5 A.
 - IX) 1 no. timer with contactor for lighting circuit.
 - X) 3 no. 32 A TPN MCBs.
 - XI) 3 no. double pole 32 A MCBs & 9 No. double pole 16 A MCBs.
 - XII) One set touch proof bus bars with rectangular shape of size 30 mm x 5 mm, made of tinned electrolytic copper suitable for 200 A continuous current rating .
 - XIII) Necessary cable glands and termination blocks.
 - XIV) Adequate number of spare terminals on terminal blocks for external connections.
 - XV) The number of outgoing feeders from AC Distribution Board shall be such that each substation equipment is fed by separate feeder with 20% as spare.

The accuracy class for all indicating and integrating meters shall be class 1

6. MAJOR COMPONENTS:

6.1 Busbar :

The busbars shall consist of tinned electrolytic copper of cross-sectional area of a minimum of 30 mm x 5 mm, suitable for carrying their rated continuous current without their temperature exceeding 85 degree centigrade. The bus bars shall be continuous throughout the cross section. The busbars shall have current rating to suit the requirements corresponding to the loads incident thereon under the various operating conditions and shall withstand the applicable voltage and maximum short circuit stress. The busbars shall be insulated from supporting structure by means of durable non-hygroscopic, non-combustible and non-tracking polyester fibre glass material or porcelain. Busbars shall be encased in heat-shrunk sleeves of insulating material which shall be suitable for the operating temperature of busbars during normal service. The busbar joints shall be provided with removable thermosetting plastic shrouds.

The busbars shall be housed in totally enclosed busbar chambers. The incoming connections from the busbar to the various feeders shall be so designed as not to disturb cable connections and to ensure safety to the operating and maintenance personnel and to facilitate working outside any outgoing module without the need for switching off in-feed to the adjacent modules, as far as possible. The phase and neutral busbar shall be of high conductivity, adequate uniform cross section and current density shall not be more than 1.6 Amp/sq. mm.

A cable alley preferably 230 mm wide shall be provided in each vertical section for taking cables into the compartments.

6.2 Incoming Circuit:

Incoming circuit shall have one no. 3 phase, 433 Volt Switch Fuse Disconnecter unit of nominal current rating of 200 Amps conforming to IS: 13947/1993 amended up to date and 3 No. LT resin cast CTs having CT ratio of 200/5 A with burden 10 VA & accuracy class 1.

To receive incoming cable, one no. 4 way bolted type connector of suitable size shall be provided.

Incoming cable for incomer LT XLPE, 4 Core, 120 sq. mm shall be provided by KPDCL.

6.3 Outgoing circuits:

6.3.1 Total of 15 no. Outgoing circuits shall be provided as per the details given below.

S.No.	S.No. of the Feeder	Feeder Rating	Cable Size
1.	1,2,3 (Total 3 no.)	TPN 32A MCBs	4 core 16 sq.mm. LT PVC cable.
2.	4,8,12 (Total 3 no.)	DP 32A MCBs	2 core 16 sq.mm. LT PVC cable.
3.	5,6,7,9,10,11,14,15 (Total 9 no.)	DP 16A MCBs	2 core 10 sq.mm. LT PVC cable.

MCBs shall comply following specifications as per IS 8828/1996.

Rated voltage & freq. shall be 240 V & 50 Hz respectively for DP MCBs.

Rated current shall be 32 A/16 A as mentioned above.

Rated short circuit capacity shall be min. 6 KA at 0.7 p.f. lag

Service short circuit capacity shall be 6 KA as per table 15 of IS: 8828 /1996.

MCBs shall have fixed un adjustable time / current characteristics.

Under voltage release and shunt-trip release coils are not required. Only overload release and short circuit release shall be provided.

Tripping time shall be as per (clause No. 8.6.1) table 6 of IS: 8828 /1996.

Limits of temperature rise shall be as per (clause No. 9.8) table 5 of IS: 8828/1996.

Standard range of instantaneous tripping shall be type 'B' as per (clause No.5.3.5) table 2 of IS: 8828 /1996.

MCB shall have precision moulded case and cover of flame retardant high strength thermo-plastic material with high melting point, low water absorption, high dielectric strength and temperature withstand capacity, and shall be capable of carrying out given number of operation cycles as per Clause No.9.11 of IS:8828/1996.

6.3.2 MCBs shall be of suitable type. It should be type tested & of approved make. All MCB outgoing terminals shall be terminated on terminal connectors provided at the bottom with suitable size of cable. The enclosure shall be provided with proper earthing arrangement. Earthing arrangement shall consist of 2 G.I. Bolts of 12 mm (min.) with 2 spring/plain washers and 2 check nuts. PVC cable glands of adequate size shall be provided for all incoming and outgoing cables.

The moving contacts of all the poles of multi pole circuit breaker shall be mechanically coupled in such a way that all the poles, except the switched neutral, if any, make and break substantially together, whether operated manually or automatically, even if an overload occurs on one protected pole only.

A switched neutral pole shall open after and close before the protected pole(s). The mechanism should be quick make, quick break with trip free mechanism.

Both side terminal should be suitable for direct cabling as well as bus bar connection and should take wire up to cross section area of 25 sq.mm.

Detailed specification is tabulated below:

Standard	IS:8828:96 & IEC:60898:2002
Type/Series	B&C
Rated Current(AC)	20A for SPN, 36A for TPN
Rated Voltage(AC) Volt	240/415
Rated short circuit breaking capacity kA	10
Protection class	IP-20

6.4 Indicating Instruments:

Principal requirements of indicating instruments are as follows:

6.4.1 Ammeter:

Ammeter shall comply the following requirements:

Class of accuracy	1
Range	0-250 Amps
Mounting	Flush type
Size	96 mm x 96 mm
Type	Panel Mounting , Digital Display
Operating Current	5A from CT Secondary

Ammeter shall be guaranteed for free replacement for any defects within five years from the date of supply.

6.4.2 Ammeter selector switch:

Ammeter Selector switch shall be a four-position rotary type with R, Y, B and 'OFF' positions marked clearly on 48 mm x 48 mm brushed aluminum plate with black handle. The Switch should be screw mounting type with finger touch proof terminals. Terminal wire should be inserted from the side of the switch terminal. Terminal screw must be captive to avoid misplace during maintenance. The switch shall be of 12 A rating with insulation level of 1100 V.

6.4.3 Volt Meter:

Voltmeter shall comply the following requirements

Class of accuracy	1
Mounting	Flush type
Size	96 mm x 96 mm
Range	0-600 volts
Type	Panel Mounting , Digital Display

Voltmeter shall be guaranteed for free replacement for any defects within five years from the date of supply.

6.4.4 Volt Meter selector switch:

Voltmeter Selector switch shall be a seven-position rotary type (6 way & off) with 3 phase to phase & 3 phase to neutral position marked clearly on 48 mm x 48 mm brushed aluminium plate with black handle. The Switch should be screw mounting type with finger touch proof terminals. Terminal wire should be inserted from the side of the switch terminal. Terminal screw must be captive to avoid misplace during maintenance. The switch shall be of 12 A

rating with insulation level of 1100 V.

6.4.5 Indicating Lamps:

Indicating lamps shall be panel mounting type 22.5 mm with rear terminal connections having LEDs display. Lamps shall have translucent lamp covers to diffuse lights, coloured red, yellow, green or blue as specified. The lamp cover shall be preferably of screw-on type, unbreakable and molded from heat resisting material.

All indications shall be bright LEDs having long life. Conventional bulbs are not acceptable.

6.4.6 Yard lighting Control Timer:

One no. universal time switch with quartz clock of following specification shall be provided for lighting circuit. Operating voltage of 240 V AC with contact rating of 16 A Timer with inbuilt contactor having 3 no. normally open (N.O) contacts for yard lighting shall be preferred. In case the same is not available, separate timer & contactor can be used. Mounting arrangement shall be DIN rail type. One no. 3 pole 2 Amp MCB shall be provided for protection circuit of voltmeter & indicating lamps.

6.5 MARKING:

Each compartment shall be provided with legible and indelibly marked/engraved name plate. Name plates shall be white with black engraved letters. On top of each module, name plates with bold letters shall be provided for feeder designation. Each device shall also be suitably marked for identification inside the panels. Name plates with full and clear inscriptions shall be provided inside the panels for all isolating switches, links, fuse blocks, test blocks and cable terminals. Every switch shall be provided with a name plate giving its function clearly. Switches shall also have clear inscriptions for each position indication e.g. 'ON' 'OFF' etc.

6.6 Earthing Arrangements:

Two no. Earthing studs of galvanized M.S. 25 mm x 6 mm shall be provided for external earth connections at the bottom. These should be complete with plain washer, spring washer, nuts etc. Earthing Bolts must be welded to prevent removal of the same from the cabinet.

Flexible stranded copper connector (braided conductor) of copper equivalent 10 sq. mm size should be connected between door and box enclosure. This flexible braided cable should be terminated using gland and proper size nuts and bolts at both ends.

6.7 Mounting Clamps:

The CTs box, ACDB box are to manufacture with suitable mounting arrangement on wall/steel support by means of 4 nos. 25 mm x 6 mm size clamps having hole dia.14 mm, fixed over the body as per drawing.

6.8 Gland Plate:

The removable gland plate should be provided in the lower portion of the box to accommodate all brass glands (according to requirement) for incoming and outgoing cables.

6.9 Name Plate:

Aluminium sheet 2 mm engraved with following details should be provided duly refitted over front door.

- a) ACDB
- b) P.O No.

- c) 'Property of KPDCL'
- d) Name of the Manufacturer

7.0 CONTROL WIRING:

The ACDB shall be furnished completely factory wired upto terminal blocks ready for external connections. All wires shall consist of 1100 V grade PVC insulated flexible stranded copper wires with a cross-section of 2.5 sq. mm suitable for switchboard wiring and complying with the requirement of relevant IS. Each wire shall bear an identifying ferrule or tag at each end or connecting point.

Control cables for external connections shall consist of stranded copper wire with 1.5 sq.mm, 2.5 sq.mm, 4.0 sq.mm or higher cross-sectional areas and shall enter from the bottom. All interconnecting/outgoing control wiring shall terminate on stud type terminals on terminal blocks. The terminals shall be marked with identification numbers to facilitate connections.

The terminal blocks shall be made of moulded, non-inflammable, plastic material and arranged to provide maximum accessibility for inspection and maintenance. All terminal blocks shall have transparent plastic cover. The terminals shall be made of hard brass and diameter of not less than 6 mm. The studs shall be securely locked within the mounting base to prevent turning. The terminal blocks shall be provided with twenty (20) percent spare terminals. The terminals shall be suitable for connections through tinned copper crimped lugs. Wiring shall be complete in all respect to ensure proper functioning of the control, protection and monitoring scheme. Each wire shall be identified at both ends with permanent markers bearing wire numbers as per wiring diagram.

8.0 TYPE TEST CERTIFICATES:

MCBs & other components used in ACDB shall be fully type tested as per relevant standards. The bidder shall furnish detailed type test reports along with the bid. The detailed Type Test Reports shall be furnished with relevant certified drawings of the equipment tested and oscillogram reports. The purchaser reserves the right to demand repetition of some or all the type tests at the cost of bidder by an independent agency, whenever there is dispute regarding the quality of supply.

All the Type Tests shall be carried out from laboratories which are accredited by the National Board of Testing and Calibration Laboratories (NABL) of Government of India such as CPRI, ERDA to prove that the MCBs & other components used in ACDB meet requirements of the specification. The bidder should also furnish certificate from laboratories that these laboratories are having all the requisite test facilities available in house. The type tests conducted in manufacturers own laboratory and certified by testing institute shall not be acceptable.

9.0 DRAWINGS:

Successful bidder shall submit the detailed drawings along with component details/makes etc. for necessary approval.

10.0 INSPECTION:

All tests and inspection shall be made at the place of manufacturer. The manufacturer shall provide reasonable testing and inspection facilities and co- operation without any charge to purchaser and satisfy him that the material is being supplied in accordance with the standard specifications. The proto type of ACDB shall be inspected & checked by third party inspection agency in presence of Ordering Authority or his representative for approval before the commencement of supply.

11.0 SCHEDULES:

The bidder shall fill in the following schedules, which form part of the tender specification and order. If the schedules are not submitted duly filled in with the offer, the offer shall be liable for rejection.

Schedule 'A' -Guaranteed Technical Particulars.

12.0 Deviations:

Deviation from this specification, if any, shall be clearly bought out in the offer. Unless purchaser explicitly accepts such deviations, it shall be presumed that the offer fully complies with the specification.

13.0 WARRANTY CLAUSE:

The warranty shall remain valid for a period of eighteen (18) months from the date of delivery or twelve (12) months from the date of commissioning of Goods at Purchaser's destination. The Supplier warrants that all the Goods supplied under the Contract shall comply strictly with the Contract, shall be first class in every particular and shall be free from defects. The Supplier further warrants that all equipment, materials and supplies furnished by the Supplier for the purpose of the Goods are new, production of the most suitable grade and fit for their intended purposes.

14.0 CHALLENGE CLAUSE:

The Purchaser reserves the right to have the material, received after inspection by the authorized inspecting officer, again tested for any parameter(s) from approved/NABL accredited testing house/in house technique of the purchaser. The results if found deviating/unacceptable or in non-compliance with the approved GTP'S, the lot shall be rejected and bidder shall arrange to replace the rejected lot within thirty (30) days of such detection at his cost including to & fro transportation.

SCHEDULE 'A'

GUARANTEED TECHNICAL PARTICULARS FOR AC DISTRIBUTION BOX		
S.No.	DESCRIPTION	GUAGANTEED TECHNICAL VALUES
1	PANEL NAME	INDOOR FLOOR MOUNTED
2	PANEL DIMENSION	
a	HEIGHT(mm)	1150 (WITHOUT STAND)
b	WIDTH(mm)	650
c	DEPTH (mm)	350
3	SHEET USED FOR FABRICATION	2.0 MM THICKNESS MS SHEET & 3 MM FOR GLAND PLATE
4	PROTECTION GRADE	IP-43
5	PAINT SHADE	
a	EXTERIOR	ADMIRAL GREY (SHADE NO. 632) OF IS:5
b	INTERIOR	ADMIRAL GREY (SHADE NO. 632) OF IS:5
6	PAINT THICKNESS	AS PER IS' 5 NOTE: ACDB SHALL UNDERGO SEVEN TANK MECHANICAL/CHEMICAL CLEANING PROCESS & PAINTING SHALL BE DONE USING POWDER COATING PROCESS WITH PAINT THICKNESS NOT LESS THAN 70 MICRONS.
7	BUSBAR	ELECTROLYTIC TINNED COPPER BUSBAR SUITABLE FOR 200A RATING
8	INCOMER	
a	SWITCH FUSE DISCONNECTOR UNIT	3-PHASE,440 VOLTS,200A

b	MAKE	
9	CT USED FOR INSTRUMENTATION	
a	TYPE z	CAST RESIN
b	MAKE	
c	BURDEN	10 VA
d	ACCURACY CLASS	1
e	RATIO	200/5
10	OUTGOING	
a	MAKE	
b	MCB 32A FP	01 NO. PER ACDB FOR LIGHTING
c	MCB 32A TPN	03 NOS. PER ACDB
d	MCB 32A DP	03 NOS PER ACDB
e	MCB 16A DP	09 NOS. PER ACDB
11	AMMETER	DIGITAL
a	ACCURACY CLASS	1
b	RANGE	RANGE OF 0-250A
c	MOUNTING	FLUSHTYPE
d	SIZE	96X96MM
e	TYPE	DIGITAL TYPE AMMETER
f	MAKE	
12	AMMETER SELECTOR SWITCH	
a	TYPE	FOUR POSITION ROTATRY TYPE (6 WAY & OFF WITH 3PHASE TO PHASE TO NEUTRAL POSITION
b	MAKE	
13	VOLTMETER	
a	ACCURACY CLASS	1
b	RANGE	0-600V
c	MOUNTING	FLUSH TYPE
d	SIZE	96X96MM
e	TYPE	DIGITAL TYPE VOLTMETER
f	MAKE	
14	VOLTMETER SELECTOR SWITCH	
a	TYPE	SEVEN POSITION ROTATRY TYPE WITH R,Y,B & OFF WITH INSULATION LEVEL. OF 1100V
b	MAKE	
15	YARD LIGHTING CONTROL TIMER FEEDER	OPERATING VOLTAGE 240V WITH 16A TIMER & FEEDER INBUILT CONTACTOR HAVING 3NOS OF NO CONTACTS
a	MAKE OF TIMER	
b	INDICATION LAMP (LED TYPE)	PANEL MOUNTING TYPE 22.5 MM REAR TERMINAL CONNECTIONS
16	WIRE USED FOR INTERNAL WIRING	COPPER FLEXIBLE PVC INSULATED 1100VOLTS OF SUITABLE SIZE FROM OUTGOING TO TERMINAL
a	32A	6 Sq.MM
b	16A	4 Sq.MM
17	CABLE GLAND	AS PER REQUIRMENT (NOT IN KECCONROLS SCOPE)
18	TERMINAL CONNECTOR	AS PER REQUIREMENT WITH 20% SPARE
19	GASKET	NEOPRANE/EPDM
20	DANGER PLATE	100X100 mm SCRIPTED IN URDU AND ENGLISH