

ANNEXURE TO TENDER NO: DPS/MRPU/1/4/3431

GENERAL SPECIFICATIONS – THREE PHASE THREE WIRE 415 V AC, 2000 A CUSTOM MADE BUSCOUPLER PANEL

DESCRIPTION OF THE ITEM :

The specification covers the Design, manufacture, testing at works, packing ,supply and safe delivery to site , installation and commissioning of 3 phase 3 wire 415 V AC, 2000 A rated custom made bus coupler panel as per the standard IEC 60947 and IS 13947. The scope of work also includes interconnection of the bus coupler panels with the existing PCC panel BTsb 100 B /BTsb 200 A.

DETAILED SPECIFICATIONS AND QUANTITY: 2 Nos.

AIR CIRCUIT BREAKERS:

Each buscoupler panel consists of one number of ACBs and they shall be designed as per the following specifications and drawings .

S/no	Technical specifications of ACBs	
1.	Type	Air break, Trip Free, fully draw out type with Anti pumping feature
2.	Operating voltage	415 V +/- 10 % AC
3.	Operating frequency	50 Hz , +/- 5 %
4.	Rated control power supply	220 V DC (+ 10 %). All the components must be rated for a safe working DC voltage level of 240 V.
5.	Rated symmetrical breaking capacity	65 kA RMS, 143 kA peak at 415 V + 10 %
6.	Utilisation category	B
7.	Shorttime withstand capacity	65 kA for 1 sec
8.	Ultimate breaking capacity	65 kA
9.	Operating Duty	O-3 min-CO-3 min-CO
10.	Making capacity	143 kA Peak
11.	Number of Poles	3 Pole
12.	Number of auxillary contacts	6 NO + 6 NC
13.	Rated Continuous Current	2000A
14.	Operations	Electrical & Manual
15.	Operating mechanism	Spring charging motor type
16.	Type of main Contacts	BUTT
17.	Material of main contacts	Silver coated copper
18.	Thickness of silver coating	5 Microns
19.	Type of arcing contacts or Arc control device	Wiping/Arc Chute
20.	Material for arcing contacts	Cu + Tungsten
21.	Opening time	40 milli seconds
22.	Closing time	60 milli seconds

BREAKER INTERLOCKS:

The bus coupler breakers are used to extend power supply from existing PCC to newly installed PCC. The existing PCC (BTsb 100 and 200) is having Class IV power supply with Class III back up (DG #1 and 2) The new PCC has Class III power supply (DG # 3 and 4 - both auto and manual breaker)

The following inter locks between the breakers shall be provided to avoid
 Paralleling of DG # 3 and DG # 4 with class IV power supply,
 Paralleling of DG # 3 and DG # 4 with DG # 1 & DG # 2 and
 Paralleling between DG # 3 and DG # 4.

Interlocks are as follows:

If bus coupler is closed, then incoming transformer breakers to BTsb 100 & BTsb 200 and their corresponding DG breaker shall be in open condition for connecting DG # 3 (Auto breaker - CBbt 147 C and manual breaker - CBbt 257 C) and DG # 4.(Auto breaker - CBbt 247 C and manual breaker CBbt 157 C).

Key operated Local / remote / off three position selector switch provision also shall be provided for all the breakers in their respective panel doors. All breakers should have service/test position interlocks. The breakers must be operable from remote position (ie, control room) only in service position. The breakers must be operable from local position only in test position. In isolated position, no electrical operation shall be possible.

All the necessary contacts from existing breakers in our plant will be provided by IGCAR for interlocks wiring in the new breakers. The Circuit breakers should be designed and wired suitably to satisfy all the above said interlocks. It is the scope of the supplier to provide necessary interlock contacts (NO/NC either directly or through additional auxillary relays) from the ACBs supplied under this tender to include in our existing breaker control logics.)

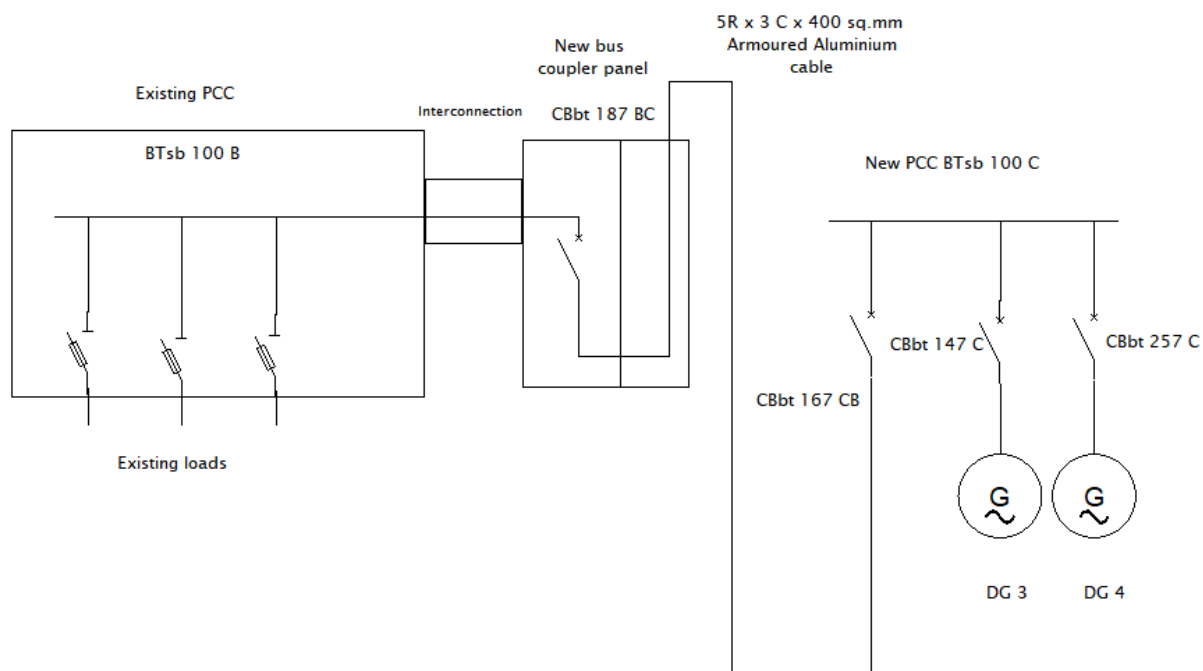


Fig 1: Bus coupler between BTsb 100B and 100 C Buses

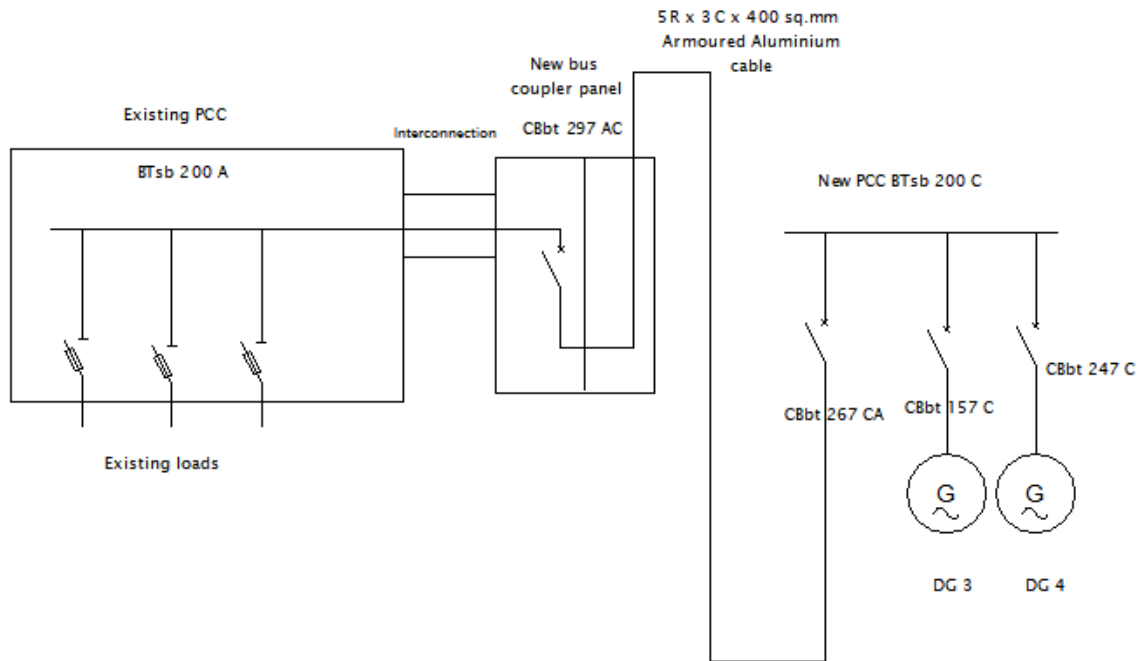


Fig 2: Bus coupler between BTsb 200B and 200 C Buses

SAFETY INTERLOCKS IN EACH CIRCUIT BREAKER:

The following safety and functional interlocks will be provided in all feeders preferably through mechanical devices.

- i) The breaker shall not be closed in any intermediate position other than the service, test and isolated positions.
- ii) Electrical closing will be possible only on service and test positions.
- iii) In test and isolated positions interlocks with other feeders will be bypassed.
- iv) It shall not be possible to open the hinged front door when the breaker is closed. Hinged door can be opened only when the breaker is racked out to the 'isolated position'.
- v) Racking in of the breaker from 'isolated position' may be possible only when the compartment door is closed. Provisions may be made to bypass this interlock by the skilled personnel thereby enabling the circuit breaker to be moved to the test position with the door open.
- vi) Racking in or out of circuit breaker shall be possible only when the circuit breaker is off.
- vii) The breaker must be lockable in all the positions and suitable lock and key arrangement shall be provided.

OPERATING MECHANISM OF ACBs:

Operating mechanism shall be quick-make, quick break and trip free type. Circuit breaker shall be provided with a manual operating mechanism & power operated mechanism as specified. Speed of closing contacts shall be independent of the speed with which handle is operated. Power operated mechanism shall be of the motor wound spring charging stored energy type. A Power operated stored energy mechanism shall be provided with a universal motor suitable for operation on 220 V DC supply as specified with voltage variation from 85 % to 110 % of rated voltage. Emergency manual charging facilities. Tripping operation shall be independent of spring charging motor. Mechanical indicators to show the "Charged " and "Discharged" conditions of the spring should be provided..It shall be possible to carry at least one closing operation on Power failure. Spring charging time

upto 20secs is acceptable. A continuous sequence of closing and opening operation shall be possible as long as power is available. Closing of circuit breaker shall automatically initiate recharging of the spring ready for next closing operation. Circuit breaker shall not close unless the spring is fully charged. Circuit breakers shall be provided with electrical anti-pumping feature.

CIRCUIT BREAKER FEEDER (BASIC COMPONENTS)

Each buscoupler panel shall consists of the 3 Pole, trip free fully draw out type Air Circuit Breaker complete with the following:

1. Set of safety shutters automatically operated with necessary interlock and with padlocking facility.
2. Motor wound Spring charged closing mechanism in addition to the manual spring charging facility.
3. Spring charging motor shall be of suitable for 220 V DC and closing coil for 220 Volts DC.
4. Trip coil shall be suitable for 220 Volts DC. Local /Remote /OFF selector switch- Lockable type.
5. Trip-Neutral-Close control switch.
6. Set of indication lamps of LED type
Red – CB close , Green – CB – Open , Amber – trip on fault
7. Space heaters rated for 240 V AC with thermostat, control fuses and MCB.
8. Circuits and devices for protection, closing, tripping and indication are as given in the specification.
9. Termination facilities for Power and control cabling shall be provided.
10. The Circuit breakers shall be Air break , Fully drawout type , Electrically / Manually operated
11. The electrically operated Circuit breakers shall be suitable for LOCAL / REMOTE operations. A mechanical trip provision shall be provided to allow manual tripping of the breaker in emergency even with front door closed.
12. Provision shall be made for manual Spring charging and manual closing of Circuit breakers. Sequence type strain free interlocking shall be provided between the various stages of operation to ensure safe and correct breaker operation.
13. All circuit breakers shall be provided with protective devices .
14. All circuit breakers shall be provided with protective devices,ie, inbuilt microprocessor based over current and short circuit protection with adjustable settings. The user shall be able to set the thresholds as per the site conditions. The operating characteristics of the devices shall be submitted by the Supplier. These shall be subjected to the approval of Purchasers. These shall be subjected to the approval of Purchasers.
15. Auxiliary contacts of Circuit breakers shall be wired for functional and spare requirement. If this is not feasible, auxiliary contacts may be multiplied by using control contactors.
16. Micro-switches for indicating “Service:, “Test” and “Isolated” positions of the breaker.
17. All drawout contacts of the circuit breaker whether Power, Control or earthing shall be silver plated.
18. All busbars must be provided with heat shrunk sleeves and colour coded.
19. An earth bus made out of **tinned copper 50 x 6 mm** shall be provided in the bus coupler panel.

DESIGN REQUIREMENTS

GENERAL

1. The buscoupler panel shall be sheet steel clad, indoor, dust tight and vermin proof, cubicle type, free standing and suitable for floor mounting. The panel shall have adequate strength to withstand all stresses imposed during shipping, handling, installation, short circuit forces without distortion or damage. The panel must have lifting bolts of sufficient strength for handling in our site using a crane.
2. The buscoupler panel shall be completely assembled as far as possible with in shipping and handling limitations, completely wired and ready for installation in accordance with this specification.
3. The panel shall be fabricated out of pressed and shaped steel. All members of the frame which have to bear the load of the structure and the modules shall be 2.5 mm thick sheet steel. The sheet steel for non load bearing members, doors and covers shall be 1.6 mm thick. Cold rolled steel shall be used for doors and covers. Undrilled gland plate shall be 3mm thickness.
4. The panel shall be supplied with an integral base frame of height not less than 50mm and are suitable for directly grouting on to the finished floor level as well as welding on MS supports in cable trenches .
5. The ACB housing shall be of minimum 800mm width.
6. The Panel shall be extensible at both ends by the addition of vertical sections in the future.

7. The Panel shall be totally enclosed dust and vermin proof with **IP 54** ingress protection. Neoprene Gaskets shall be provided for doors and cutouts. The Panel shall have non-segregated Aluminium busbars suitably provided with heat shrunk PVC sleeves. Color-coded band shall be provided at regular intervals for phase identification. They shall be mounted on supports, molded out of glass reinforced thermosetting plastic.
8. The Panel shall have designed for installation adjacent to our PCC and provision for interconnection with the bus bars of our existing PCC in the top shall be provided.
9. A sheet steel, hinged, removable door shall be provided. Indicating lamps, pushbuttons, multifunction meters shall preferably be mounted.
10. The circuit breaker shall be housed in a separate fully enclosed compartment. The outgoing busbars of the ACB shall be brought to an adjacent vertical for enabling cable termination from the top. The segregation between various compartments shall be achieved by using sheet steel and/or insulating partitions. There shall be complete compartmentalization of vertical bus bars, ACB and cabling chamber area.
11. The PCCs shall be suitable for operation on 415V-3 Phase- 3 wire-50 Hz AC supply system with Voltage variation of 10% and Frequency variation of 5%.The PCCs shall be suitable for a fault level of 65 kA.

APPLICABLE STANDARDS:

The equipment shall be designed to conform to the requirements of the following Standards with latest amendments.

1. IS 13947 , IEC 60947
2. IS 8623 part -1
3. Seismic withstand : IS 1893 (panel should be designed for seismic zone III)
4. IS 4237 – General requirements for switchgear and control gear for voltages not exceeding 1000Volts.
5. IEC 60529 and IS 2147- Degree of protection provided by enclosures for low voltage switchgear and control gear
6. IS 8623 – Bus bars

Safety norms to be complied :

All the LV switchboards shall meet the following safety norms :

- i. “CE” marked switchgear.
- ii. Superior quality engineering grade plastics used for insulation purpose (IEC 60695 – 2 -1)
- iii. In built anti pumping feature for electrically operated ACBs prevent auto reclosing of ACB on fault.
- iv. In built safety interlocks for drawout type ACBs in their respective cradle.
- v. Safety shutters prevent accidental contact with live cradle terminals.
- vi. Easily removable arc chutes without use of any tools.
- vii. Operating voltage ranges from 10% to 110% for shunt release ensures intentional tripping even at high voltage drops during short circuit.

CONSTRUCTIONAL FEATURES IN SWITCHGEAR ASSEMBLY:

1. The circuit breakers shall be fully drawout i.e, incoming and outgoing Power contacts and breaker secondary isolating control contacts shall be of fully drawout type. The drawout mechanism of the ACB shall move on telescopic rails.
2. There shall be 3 distinct and separate positions of the Circuit breaker on the cradle viz.,
3. i)**SERVICE** : Both main power and secondary isolating contacts connected.
4. ii)**TEST** : Main power contacts disconnected and secondary isolating contacts connected.
5. iii)**ISOLATED** : Both Main Power and Secondary isolating contacts disconnected.
6. The first three positions as described above shall be achieved by means of a racking handle with the Door CLOSED for providing complete protection and safety to the operating personnel.
7. It shall not be possible to open the ACB door unless the ACB is drawn to “Isolated” position.
8. It shall be possible, however, to defeat the above door interlock (for inspection purposes) so that the door can be opened with ACB in SERVICE or TEST position.
9. The door interlock shall automatically restore on re-closing the door.It shall be possible to padlock the ACB in either TEST or ISOLATED positions to prevent unauthorized person from moving the breaker from its intended position.Attempted insertion to or withdrawal from the SERVICE (Connected) position of a closed circuit breaker shall cause tripping of the breaker before the main contacts engage or disengage respectively.

10. The drawout breaker shall be earthed by means of a scraping earth system of a silver plated copper such that the earth connection is broken after the breaker Main contacts disengage during withdrawal and the earth connection is made before the main contacts engage during insertion. The earth connection shall remain connected in "TEST" and "ISOLATED" position also.
11. The Drawout ACBs shall be enclosed in chassis, so that operational stresses will not distort the switchboard. The Circuit breakers shall be fitted with detachable ARC CHUTES on each pole designed to permit rapid dispersion, cooling and extinction of Arc.
12. Inter-phase barriers shall be provided to prevent flashover between phases. The inter phase barriers shall be of polycarbonate material. For circuit breakers it can be provided on the terminals. However it will cover only the ACB terminals and will not cover the entire riser link. Arcing contacts shall be hard wearing material of copper tungsten or silver tungsten and shall be readily replaceable.
13. Main contacts shall be of hard silver plated copper of high pressure butt type of generous cross section.
14. Mechanical indication shall be provided for manual charging, closing and tripping of the Circuit breaker during emergencies.
15. Automatically operated safety shutters shall be provided to screen the fixed isolating Power contacts when the Circuit breaker is drawn out from the cassettes. It shall be possible to padlock the shutters.
16. The panels shall be supplied completely wired internally to equipment and terminal blocks and ready for Owner's external cable connections at the outgoing links terminal blocks. The wiring shall be complete in all respects so as to ensure proper functioning of control, protection and interlocking schemes.
17. The control wiring shall be with 1100 volts grade, FRLSH PVC insulated stranded copper wires of 2.5 sq.mm. Control wires shall be identified at both ends with wire designations in accordance with the relevant Indian Standards using interlocking ferrules. Not more than two wires shall be connected to one terminal.
18. All control wires shall be neatly bunched and adequately supported to prevent any sagging.
19. The cabling chamber of adequate size for accommodation, support and termination of aluminium cables at the top shall be provided at the rear. Facility to extend cabling area by additional cable chamber shall be preferred.
20. Trip circuits shall be suitable for 220 V DC. The control wiring and termination shall be such that each instrument/relay can be disconnected from the circuit without disturbing either instrument/relays. The ratings of the various HRC fuses and MPCBs shall be as per Type 2 co-ordination.
21. Trip coils shall operate for a voltage from 10 percent to 110 percent and closing coils shall operate for voltage from 85 percent to 110 percent. Spring charging motor shall work from 85 percent to 110 percent of voltage.

EQUIPMENT IDENTIFICATION:

Engraved metal name plates shall be provided on the door of each breaker compartment. The name plates shall be provided on the front, on the corresponding door on the rear side, and on the drawout cubicle. Inside a compartment name plate shall be provided for each equipment having equipment designation. These name plates shall bear brief description of the equipment, which will be furnished later. Each transport shipping section of the Switchboards shall have engraved metal plate with Switchboards number and the section number, these details shall be prominently painted outside the crate after packing.

Switchboards designation shall be displayed prominently in one or more locations. Shipping sections shall be designated and identified clearly.

Separate name plates shall be provided furnishing the following with minimum letter size of 12 mm.

- | | |
|------------------|-------------|
| a. FEEDER RATING | b. FUNCTION |
|------------------|-------------|

Anodised aluminium labels with white inscription on black background shall be provided. For component identification inside the Switchboards, specially designed yellow colour insta print PVC stickers shall be provided.

PRE TREATMENT AND PAINTING – POWDER COATING:

The panels must undergo standard , Seven Tank Phosphating Pre-Treatment Process.

STAGE – 1 : ALKALINE DEGREASING. STAGE - 2 : WATER RINSING. STAGE - 3 : RUST REMOVER. STAGE (ACID PICKLING)- 4 : WATER RINSING. STAGE - 5 : PHOSPHATING. STAGE - 6 : WATER RINSING. STAGE - 7 : PASSIVATION

The work piece is hooked on a conveyor and given a coat of Epoxy Polyester based semi glossy paint powder of shade RAL – 7035. This coating is done electrostatically and after coating, the work piece is stoved at 180 – 205 degree Celsius for 12 – 20 minutes. The Dry Film Thickness (DFT) achieved is of the order of 50 – 60 microns.

All the process parameters are continuously monitored for uniform finish and proper quality output. Epoxy polyester powder coat has excellent adhesion to the base / surface and exhibits high scratch resistance & chemical resistance. It provides excellent resistance to alkaline, acids, greases, mineral oils, alkaline soaps & water. The powder-coated sample is to be tested for the finish, shade, and gloss, scratch hardness, marresistance, crosses cut adhesion, flexibility test & resistance to over baking. It can undergo the Salt spray Test beyond 500 hours and exhibits excellent corrosion resistance. Detail on sheet metal treatment & painting shall accompany the offer.

DANGER BOARDS & CAUTION BOARDS

All the Switchboards shall have Standard danger boards of appropriate size complete with SYSTEM VOLTAGE, SKULL MARK, etc, with letters in English, Tamil and Hindi. danger boards shall be fixed in the front and rear of the switchboards. Caution boards with appropriate warning shall be provided to prevent wrong operation and wherever required.

General Requirements :

i. **Contractors license :** The tenderer shall possess grade A Electrical license from the Tamil Nadu State Licensing Authority for carrying out electrical installation work. The persons deputed by the tenderer should also hold valid license issued by the licensing boards of state/locality in which work is to be carried out. In addition, the contractor shall also appoint and depute qualified and experienced electrical engineers for overall supervision of the work at site.

ii. **Workmanship:** Good workmanship and neat finished appearance are basic requirements of installation work. To ensure good workmanship of all works, the contractor shall deploy only qualified and well-experienced staff. Names and particulars of all such staffs shall be furnished to the department before initiation of work.

iii. **Structural hardware :**

All nuts, bolts and washers shall be of stainless steel and adequate sized to meet requirement.

iv. **Completion and Guarantee :**

After completion, testing and commissioning of entire electrical works, the contractor shall hand over the installation to the department along with a completion certificate and guarantee for 12 months for successful operation. Any defect/failure in installation during this defect liability period shall be replaced repaired at free of cost by the contractor.

SCOPE OF TENDERER:

1. The buscoupler panel should be custom designed for interconnection with our existing PCCs BTsb 100 B and 200 A .
2. On getting the PO, the supplier should carry out study of the existing system and prepare detailed engineering drawings of the buscoupler panel.
3. On getting approval of the department the manufacture of the panels should be started at the earliest.
4. PDI will be conducted by the department representative at the manufacturer's premises.

SITE INSTALLATION:

The site installation work involves,

1. Erection of bus coupler panel adjacent to the the existing PCC panel BTsb 100 B/ BTsb 200A and integration of the panel with the PCC by interconnecting the bus bars. The incomer of the buscoupler should be connected to the existing PCC panel. The supplier should design the buscoupler for either direct integration with the PCC by placing it adjacently or through a fully enclosed air insulated bus ducts and adaptor boxes with flexible copper links for integration purpose. The complete ,design, supply and installation of interconnecting parts is also in the scope of the supplier.

2. The outgoing of the bus coupler panel is from the top side of a adjacent vertical cable chamber and shall be able to terminate 5R x 3 C x 400 Sq.mm armoured aluminium cables (IGCAR scope) for transferring power to the new PCCs in flood safe building. Suitable cable adaptor boxes and gland plates shall be provided in the top for power and control cable entry.
3. The installation of bus coupler panels and shall be taken up as soon as they are delivered and shall be completed in a single phase within **6 months** from the date of Purchase order. Installation procedures and support arrangements shall be finalized well in advance and got approved by the Purchaser. All the material shall be procured only from the reputed manufacturers only.

TENDER EVALUATION CRITERIA:

1. OEM can directly quote for the tender. The tenderer must submit the following.

All the test certificates for similar 415 V, 2000 A rated LV panels manufactured by them ie, heat runtest , short circuit withstand test , dielectric test etc, as per IS 13947/IEC 60497 ,IP 54 protection test certificate as per IEC 60529 , tentative GA drawing , completely filled GTP, test facilities in their manufacturing premises. The site installation and commissioning agency should have A grade electrical license issued by TN licensing authority must be reputed contractors who have experience in executing similar works. The test certificates must have be issued by reputed testing centres like CPRI,ERDA etc.

2. Dealers / Licensed partners of OEMs can also quote for this tender and must submit the authorised dealership / license certificate issued directly by the OEM and should meet the above mentioned evaluation criteria. Bids not meeting the above will be rejected.

Note: Offers will be evaluated and accepted on overall lowest technical suitable offer basis. Hence, offers of partially quoted suppliers will not be considered for evaluation.

DRAWING AND DESIGN APPROVAL:

The following are to be submitted after award of contract for getting approval from the purchaser before commencement of production. Detailed drawings shall be prepared in AUTOCAD and shall be submitted for approval prior to taking up the manufacture. The list of drawings shall be as follows:

1. Detailed General arrangement drawing of bus coupler panel and interconnection design.
2. Detailed wiring diagram clearly indication the wire numbers, terminal numbers, terminal chart and sequence of wiring/looping.
3. Busbar arrangement , exploded view of components , Busbar termination arrangements for Incoming and outgoing.
4. Bill of materials with makes of component list.
5. Cable chamber details with gland plate details.
6. Foundation plan of bus coupler panel.
7. QAP
8. The supplier shall submit comprehensive service and spare part manuals for all the equipment under the scope of this order in addition to standard operating & maintenance manuals.

ACCEPTANCE CRITERIA :

All routine tests on main equipment and auxiliary equipment as mentioned in this specification shall be carried out in the presence of Departmental representative. The Purchaser shall be intimated sufficiently in advance when the equipment is ready for stage or final inspection.

The following tests shall be conducted as part of routine tests at the manufacturer's premises in presence of department representative.

1. Dimensional Check
2. Physical verification of components
3. Insulation resistance tests of Power and Control circuits before and after HV test
4. High voltage tests on Power & Control wiring – 2.5 kV for One Minute on Power and 2 kV for One minute on Control Circuit with all meters, relays and instrument transformers in circuit.
5. Functional tests including sequence of operation interlocks, speed of operation.
6. Routine testing on ACBs ie, Functional test including sequence of operation , Carbon impression test, opening and closing time measurement, millivolt drop across the breaker contacts.
7. Continuity test and Polarity test on all coils and circuits.
8. Millivolt drop test at all busbar joints.

All major components incorporated in the switchgear (such as Circuit breakers) shall have undergone type tests as per their respective standards. Type test certificates for the same shall be submitted.

INSPECTION AND TESTING:

The Manufacturer's works will be accessible for the purchaser's representatives for stage inspection as and when required. Test schedule for the equipments shall be finalised in consultation with the Purchaser and 30 days advance intimation shall be given to enable the Purchaser's representative to witness the tests.

Stage inspection as well as final inspection as per following shall be carried out as given below.

1) STAGE INSPECTION –I:

Review of manufactures test certificates on all bought out components.

BUS BAR:Review of test report on chemical composition of bus bar material.

Review of test report on tensile strength of bus bar.

Review of test report on conductivity of bus bar.

Review of test report on bend test on bus bar.

2) STAGE INSPECTION – II: TEMPERATURE RISE TEST

Since temperature rise test is of type test nature, manufacture shall first fabricate one number of bus coupler panel (which type of panel to be fabricated shall be informed to the manufacturer after stage I inspection). This one bus coupler panel shall be completed in all respects and tested for temperature rise test as per IEC 61439 part -II. Production of other bus coupler panel shall start only after acceptance of the temperature rise test by the Purchaser. After temperature rise test, any suggestion for modification or for improvement in design in panel shall be incorporated for remaining panel manufactured after approval of temperature rise test.

3) STAGE INSPECTION III: ROUTINE TEST

All the routine tests as mentioned above as per relevant Standards will be conducted at Works in the presence of the Purchaser representative on all components and the assembled units.

At least 3 copies of test report shall be submitted for the purchaser's approval and record. Panels shall be dispatched only after obtaining purchaser's approval on test report. Manufacturers test certificate for bought out items shall be a part of supply and shall be scrutinized during inspection along with internal test as per the accepted Quality Assurance program. The Manufacturer shall submit all the as built Drawings while delivering the panels. Three sets of commissioning manual & factory test reports shall be hand over to the department as spiral bounded copies.

GUARANTEED TECHNICAL PARTICULARS OF BUS COUPLER PANEL AND ACB

Sl no	Description	To be filled by the supplier in his bid
1.	Switchgear (including ACB) Make & Model	
2.	Short time withstand rating of the switchgear (rms)	
3.	i. 1 sec	
4.	ii. 3 sec	
5.	Mechanical (momentary) withstand rating of the switchgear (Peak)	
6.	Design voltage of the switchgear buses	
7.	Rating of the switchgear buses	
8.	Clearances	
9.	i. Between Phases (live parts)	
10.	ii. Between live parts and earth	
11.	Creepage path to earth	
12.	Type and material of inter-phase barriers	
13.	Test voltage of complete cubicle	
14.	Power frequency withstand voltage for 1 minute	
15.	Material and thickness	
16.	i. Load bearing	
17.	ii. Front panels	
18.	iii. Back panels	
19.	iv. Panels between units	
20.	v. End panels	
21.	Dimension	
22.	i. Length	
23.	ii. Depth	
24.	iii. Height	
25.	Weight	
26.	Total weight of Switchboard	
27.	Shipping dimensions of the largest Package.	
28.	Minimum recommended clearances for installation	
29.	i. In front of cubicles to permit to draw out of breakers / modules	
30.	ii. In front of cubicles with two switchgear rows facing each other.	
31.	iii. Behind cubicles	
32.	Method of circuit grounding	
33.	Insulating barriers and supports	
34.	i. Bus bar joints	
35.	ii. Cable termination end	
36.	iii. Material	
37.	iv. Spacing of supports	
38.	v. Anti tracking features, if any	
39.	Control Wiring	
40.	i. Current circuits	
41.	ii. Voltage circuits	
42.	BUSBARS	
43.	i. Material.	
44.	ii. Type of insulation	
45.	iii. Details of bus bar segregation	
46.	iv. Maximum continuous current rating	
47.	v. Momentary rating (peak)	

48.	vi. Thermal rating – 1 sec	
49.	Temperature rise of the busbars over the specified ambient,	
50.	Cross section of the bus bars used in 2000 Amps ACB	
51.	Earth bus	
52.	i. Material	
53.	ii. Cross section	
54.	Painting / Surface treatment procedures	
55.	i. Degreasing	
56.	ii. Rust removing	
57.	iii. Phospating	
58.	iv. Passivating	
59.	v. Primer coating	
60.	Painting Shade	
61.	i. Cubicle exterior and interior	
62.	ii. Non conducting metal parts	
63.	iii. Conducting metal parts.	

Schedule of Spares: The bidder shall submit the spares list for trouble free operation of 5 years and the break up details should be given as attachment along with GTP as per the format given below. The total amount for the spares should be quoted in the tender price bid sl no 2.

S.No.	Description	Qty.

The final spares list/quantity shall be on the purchaser discretion.

Signature & Seal of the Bidder