

भारतीय प्रबंध संस्थान इंदौर
INDIAN INSTITUTE OF MANAGEMENT INDORE

प्रबंध शिखर, राऊ-पीथमपुर रोड, इंदौर - 453 556

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निविदा क्रमांक/Tender No: IIMI/2019-20/32



दिनांक/Date: 18-Sep-2019

सिद्धिमूलं प्रबन्धनम्
भा. प्र. सं. इन्दौर
IIM INDORE

विद्युत सामग्री की आपूर्ति के लिए निविदा आमंत्रण सूचना
NOTICE INVITING TENDER FOR SUPPLY OF ELECTRICAL ITEMS

(E-PROCUREMENT MODE ONLY)

भारतीय प्रबंध संस्थान इंदौर (आईआईएम इंदौर) दो बोली प्रणाली में निम्नलिखित मदों के लिए ओईएम / अधिकृत वितरकों / अधिकृत विक्रेताओं / अधिकृत खुदरा विक्रेता से ऑनलाइन बोली (ई-टेंडर) आमंत्रित करता है।

Indian Institute of Management Indore (IIM Indore) invites online bids (e-tender) in Two bids systems from OEM / Authorized Distributors / Authorized Dealers / Authorized Retailers for the following:

निविदा का संक्षिप्त विवरण Brief Details of Tender:

मद का विवरण Item Description	मात्रा Quantity	निविदा की अनुमानित कीमत Estimated Cost of Tender	अग्रिम जमा EMD	निविदा फीस सभी टैक्स मिलाकर Tender Fee (inclusive of all taxes)
Supply of Electrical Items	17 Items	₹ 43,63,000/-	₹ 90,000/-	₹ 1,500/-

निविदा दस्तावेज <http://eprocure.gov.in/eprocure/app> से डाउनलोड किया जा सकता है और केवल इसी पोर्टल के माध्यम से जमा किये जाने की अंतिम तिथि और समय तक प्रस्तुत किया जाना चाहिए।

The Tender Document can be downloaded from Central Public Procurement (CPP) Portal <http://eprocure.gov.in/eprocure/app> and bid is to be submitted online only through the same portal up to the last date and time of submission of tender.

निविदा की महत्वपूर्ण तिथियाँ Critical Dates of Tender:

क्रमांक/S. No.	विवरण/Particulars	दिनांक/Date	समय/Time
01	निविदा के ऑनलाइन प्रकाशन / डाउनलोड की तिथि एवं समय Date & Time of Online Publication/Download of Tender	18-09-2019	1730 Hrs.
02	बोली जमा करने की प्रारंभ तिथि एवं समय Bid Submission Start Date & Time	18-09-2019	1730 Hrs.
03	बोली जमा करने की अंतिम तिथि एवं समय Bid Submission Close Date & Time	03-10-2019	1500 Hrs.
04	अग्रिम जमा राशि और निविदा शुल्क जमा करने की अंतिम तिथि एवं समय Closing Date & Time for Submission of EMD & Tender Fee	03-10-2019	1500 Hrs.
05	बोलियों का खोला जाना Opening of Bids	04-10-2019	1500 Hrs.

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1. ABOUT IIM INDORE

Indian Institute of Management Indore is an institution of national importance under the Indian Institutes of Management Act, 2017.

2. TECHNICAL SPECIFICATION (Schedule of Requirement):

Sr No	Description	UO M	Quantity	Specification	Required Make	Minimum Warranty
1	Rubber Mat checkered suitable for system voltage of 11 KV	No.	8.00	High Voltage Insulation Mat are relatively thin mats of thickness 3.0 mm made of elastomeric polymers material having a high Insulation resistance, thus imparting total safety of human being from any leakage current, Class-C, Thickness-3.0mm, The safe volt Synthetic Insulating Mat-confirming to IS 15652:2006 has superseded the rubber mat with IS 5424 (cold standard), Size (1mtr. x 2 mtr.)		1 Year
2	12C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor	Mtr.	300.00	12C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor, XLPE insulated, colour coded as per I.S. for easy identification, cores laid up & provided with PVC inner sheath and extruded outer sheath. The extruded outer sheath shall be of Type ST 2 as per IS: 5831 - 1984 and cable shall be conforming to IS: 7098/ Part-I / 88 with latest amendments and bearing ISI mark.	Make: Polycab / Finolex / R R Kabel / Lapp	
3	4C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor	Mtr.	100.00	4C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor, XLPE insulated, colour coded as per I.S. for easy identification, cores laid up & provided with PVC	Make: Polycab / Finolex / R R Kabel / Lapp	

				inner sheath and extruded outer sheath. The extruded outer sheath shall be of Type ST 2 as per IS: 5831 - 1984 and cable shall be conforming to IS: 7098/ Part-I / 88 with latest amendments and bearing ISI mark.	
4	2C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor	Mtr.	250.00	2C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor, XLPE insulated, colour coded as per I.S. for easy identification, cores laid up & provided with PVC inner sheath and extruded outer sheath. The extruded outer sheath shall be of Type ST 2 as per IS: 5831 - 1984 and cable shall be conforming to IS: 7098/ Part-I / 88 with latest amendments and bearing ISI mark.	Make: Polycab / Finolex / R R Kabel / Lapp
5	3 Core 300 Sqmm size of 11 KV grade armoured cable	Mtr.	300.00	3 Core 300 Sqmm size of 11 KV grade armoured cable with electrolytic grade Aluminium conductor as per IS:8130, conductor screen of semi-conducting compound, XLPE insulation, insulation screen of semi-conducting compound , copper tape screen, colour coded, cores laid up with Polypropelene [PP] fillers, with binder tape and extruded PVC inner sheath as per IS:5831, armoured as per IS:3975, overall ST2 FRLS PVC sheath as per IS:5831, conforming to IS:7098/ Part-II/1985 with up-to-date ammendments	Make: Universal/Polycab/Finolex/Ravi Cable/R R Kabel,
6	3 Core 300 Sqmm size of 33 KV grade armoured cable	Mtr.	100.00	3 Core 300 Sqmm size of 33 KV grade armoured cable with electrolytic grade Aluminium conductor as per IS:8130, conductor screen of semi-conducting	Make: Universal / Polycab / Finolex / Ravin Cable / R R Kabel

				compound, XLPE insulation, insulation screen of semi-conducting compound , copper tape screen, colour coded, cores laid up with Polypropelene [PP] fillers, with binder tape and extruded PVC inner sheath as per IS:5831, armoured as per IS:3975, overall ST2 FRLS PVC sheath as per IS:5831, conforming to IS:7098/ Part-II/1985 with up-to-date ammendments		
7	50 mm x 5 mm EC Grade Copper strip	Mtr.	150.00			
8	50 mm x 5 mm Hot Dipped Galvanised Iron strip with zinc coating of 120 micron	Mtr.	800.00			
9	ACSR DOG Conductor	Mtr.	800.00	ACSR DOG Conductor as per IS - 398 (Part - II) 1996 Specification: Aluminium area (sq.mm) : Nominal - 100, Sectional - 105, Total Sectional area (Sq.mm) 118.5, Stranding & wire Diameter (Conductor (Al) - 4.72 & Conductor (Steel) 1.57, Overall Dia (mm) (Approx) 14.15, Weight mass - 394 (Al-288.3 & Steel-105.7) Kg/Km, Resistance AT 20 deg C (Ohms/Km) (Max)-0.2792, Ultimate Breaking load (Kn)- 32.41, Current Carrying Capacity - 239 Amps (65 Deg. C) 291 (75 Deg.C).	Make : Atlas Switchgear / Jaipuria Brothers / National Switchgears / Mahalaxmi	
10	33KV (70KN) polymer Disc insulator	No.	22.00	33 KV Polymer Disc Insulator, refrance Standard: IEC 61109, Material of sheds: Silicon Rubber, Type of metal end fittings: SGCI/MCI, Material of sealing compound: RTV Silicon, Colour of sheds: Grey, Rated Voltage 33 KV, Highest voltage: 36 KV, Dry power frequency withstand voltage: 95 KV, Wer power frequency withstand voltage: 75 KV,	Make : Atlas Switchgear / Jaipuria Brothers / National Switchgears / Mahalaxmi	

				Dry power frequency 130 KV, Visible Discharge Voltage (PF): 27 KV, Wet power frequency: 90 KV.		
11	33KV (10KN) polymer Pin insulator	No.	36.00	33 KV Polymer Pin insulator with G.I. Pin, Nominal system voltage 33 KV, Highest system voltage 36 KV, Power frequency: 50 Hz System Earthing 33 KV Impedance earth, Reference Standard: IEC 61109, Material of sheds: Borron free ECR, Material of Top End Fittings: SGCI/MCI/FORGED STEEL, Material of Bottom End Fittings: FORGED STEEL, Dry Power Frequency Withstand: 95 KV, Wet Power Frequency Withstand: 75 KV, Dry Power Frequency Flashover Voltage: 130 KV,	Make : Atlas Switchgear / Jaipuria Brothers / National Switchgears / Mahalaxmi	
12	Outdoor type 33 kV/ 3/110V/ 3 cast resin insulated 30 VA per phase potential transformer	No.	9.00	Please refer detailed specification given on Page No. 07 to 09	Make: Laxmi Engineering / Apoorv Electricals / Universal Isolator	1 Year
13	Outdoor type 33KV oil immersed Current Transformer	No.	6.00	Please refer detailed specification given on Page No. 10 to 15	Make: Laxmi Engineering / Apoorv Electricals / Universal Isolator	1 Year
14	33KV , 30KA Polymer Lightning Arrestors (L.A.)	No.	6.00		Make: Oblum / Elpro / GK Electrical / Tyco	1 Year
15	33 KV, 800 Amps Gang operated Isolators	No.	1.00	Please refer detailed specification given on Page No. 16 to 23	Make: Atlas / Universal Isolator / GK Electricals / Mahalaxmi	1 Year
16	Outdoor type 33 kV Porcelain Clad Vacuum Circuit Breaker	Set	3.00	Please refer detailed specification given on Page No. 24 to 30	Make: BHEL / ABB / CG / Schneider	1 Year
17	11 KV Indoor H.T. Vacuum Circuit Breaker	Set	1.00	Please refer detailed specification given on Page No. 31 to 46	Make: BHEL / ABB / CG / Schneider	1 Year

DETAILED TECHNICAL SPECIFICATION OF ITEM AT SERIAL NUMBER 13

33kV oil Immersed Outdoor Type Potential Transformer, class 1.0:

Make: Laxmi Engineering/Apoorv Electricals/Universal Isolator (Indore)

1.1 General Requirement:

33 KV Single Phase Potential Transformer shall conform to IS-3156:92 with its latest amendments if any.

The oil filled PT complete with core, H.V. Coil & LV Coil housed in a full weather proof outdoor pole mounting type steel tank with one number of 33 KV weather proof porcelain bushing on the primary side for incoming connections.

Secondary terminals of the potential transformers shall be brought-out on the side of the tank to a separate terminal box. Box shall be made suitable for taking out secondary connections through armoured XLPE Insulated PVC Cables. Entry of the cables into the box of the unit shall be through glands and check nuts to be supplied along with epoxy compound.

The transformer tank shall be given three coats of rust preventing paint and finished with light gray no. 631-IS-S on all external surfaces. The tank shall be provided with lifting hooks properly welded on the side or top cover plate of the tank.

The dimensions and electrical characteristics of the 33 KV bushing shall be in accordance with IS: 2099 and its subsequent amendments, if any.

The minimum electrical clearance between phases and phase to earth shall be as per IS.

The top of the tank will have slope to drain the rain water and avoid collecting pockets. For indication of oil level, suitable oil level indicator should be provided.

To prevent moisture entry in the bushing chamber, the nuts on the top of the stem would be sealed with araldite. Further, the angular space between the stem and the bushing will be filled with epoxy cast compound or with araldite to prevent ingress of moisture.

The insulating materials for winding between HV and LV between interlayer of the winding for end turns shall be as per relevant IS. However, end turns have to be provided with enforced insulation and lead connecting to the bushing shall be provided extra insulation of fiber glass sleeves.

Voltage rating, PT ratio, class of accuracy, burden of 33 KV Single Phase PTs shall be engraved/painted on the body of main tank as well as on name plate.

The potential transformer will be connected phase to neutral with neutral point solidly earthed. The neutral of the system is also solidly earthed.

The potential transformers shall be designed to limit the temperature of winding and other parts as specified in the standards, when corrected for the difference between the temp.

prevailing at site and temperature specified by the standards. The temperature rise at 1.2 times rated primary voltage when applied continuously at rated frequency and at rated burden shall not exceed the limits specified above and the temperature rise at 1.5 times rated primary voltage when applied for 30 seconds starting from previous stable operating conditions at the rated frequency and rated burden shall not exceed the above temperature limits by more than 10°C.

1.2 Type Tests:

The Single Phase PT shall be type tested, as per IS-3156/1992 with latest amendment, if any from NABL accredited testing laboratory. The type test comprises of following: -

- i. Temperature Rise Test
- ii. Lightning Impulse Test
- iii. Determination of errors or other characteristics according to requirement of the appropriate designation or accuracy class.
- iv. HV Power frequency wet withstand voltage test.

1.3 Routine Test:

Each 33 KV Single Phase PT shall be subject to routine tests in accordance with IS-3156 (with it latest amendment if any) at manufacturer's works and shall be witnessed in the presence of IIM's representatives, if so, desired by the IIM, Indore. The routine test comprises of following:-

- i. Verification of terminal marking and polarity test
- ii. Power Frequency Dry withstand voltage test on Primary winding
- iii. Induced over voltage withstand test
- iv. Power Frequency Dry withstand test on Secondary winding
- v. Partial Discharge Tests in accordance with IS-11322/1985
- vi. Determination of errors or other characteristics according to requirement of the appropriate designation or accuracy class.

Routine tests indicating results of all the required tests should be submitted in duplicate by the manufacturer along with the inspection offer or with inspection report.

1.4 Particulars of 33 KV Outdoor Potential Transformer, cast resin insulated

Sr. No.	Description	Particulars
1	Equipment	33 KV, Out Door, Single Phase, Oil Cooled Potential Transformer
2	Reference Standard	IS : 3156
3	Type	Dead tank
4	Rated voltage	33 KV
5	Highest voltage	36 KV
6	Frequency	50 Hz.
7	Basic Insulation Level	Primary : 36 KV / 70 KV / 170 KV(p) Secondary : 3 KV for 1 minute
8	Class of insulation	Class A
9	Creepage distance	900 mm (minimum)
10	Ratio	33000/ $\sqrt{3}$: 110/ $\sqrt{3}$
11	Class of accuracy	1
12	Burden	30 VA
13	Voltage factor	1.2 Continuous, 1.5 times for 30 Sec.
14	Core identification	Instrumentation, Metering & Protection
15	Place of installation	Out Door, Structure mounted
16	Primary terminal connector	Rigid type suitable for PT Stud to Dog ACSR

DETAILED TECHNICAL SPECIFICATION OF ITEM AT SERIAL NUMBER 14

33kV oil Immersed Outdoor Type Current Transformer, class 1.0:

Make: Laxmi Engineering/Apoorv Electricals/Universal Isolator (Indore)

1.1 Scope:

This specification covers design, manufacturing, testing, and inspection during manufacturing and before dispatch at manufacturer`s works of 33 KV Outdoor Single Phase, Tape/Paper Insulated, Oil Cooled Current Transformers for relaying and metering purpose for 33 KV solidly grounded system complete with Bimetallic Terminal Connectors.

1.2 General Requirement:

- a. The 33 KV current transformers shall be of outdoor type, single phase, oil immersed self cooled dead tank design. These CTs shall also be suitable for operation in humid atmosphere and in the tropical direct sunlight with temperature up to 50°C.
- b. The above 33 KV CTs meant for outdoor application should be suitable for use in areas prone to heavy lightning strokes. The CTs should be suitable for satisfactory operation under all types of adverse climatic conditions, prevailing in the State of M.P.
- c. Further, the above CTs are required to be mounted on a cantilever support provided on outdoor structure of circuit breaker in the switchyard. The CTs will therefore, have suitable mounting holes in the base channel, for clamping on the structure.
- d. The offered CTs will be dead tank design. Live tank designs CTs are not acceptable.
- e. The current transformers shall have the following specifications: -

33KV Outdoor Oil Immersed Dead Tank Single Phase CT. Details as under:-

Ratio	: 150-75/5-5A
Core-I	: 15VA, CL 1.0
Core-II	: 15VA 5P10
STC	: 26.4KA / 3 Sec.
Insulation Level	: 36KV/ 70KV/ 170KVp
Terminal Connector	: 2 No. ACSR DOG
Standard	: IS 2705-1992

1.3 Design:

As stated above, the 33 KV CTs shall be of Tape / Paper insulated, Oil Cooled type housed in steel tank. The steel tank thickness for 33 KV CTs shall not be less than 3mm. Welded joints have to be minimized to avoid possibility of oil leakage in CTs. In any case welding in horizontal plane shall be avoided.

Adequate slop shall be provided on top of the tank to avoid collection of rain water. Besides marking on the name plate, serial number and make shall be additionally engraved on the sides of the CT Units.

1.4 Standards:

The current transformers shall fully comply with the latest issue of Indian Standard 2705 (Part-I, II, III & IV) with latest amendment thereof up to the date of issue of this tender.

1.5 Design and Manufacturing Requirement:

- a. The 33 KV current transformers shall be outdoor single phase, oil cooled type, suitable for the services indicated, complete in all respect conforming to the modern practices of design and manufacturing.
- b. The core shall be of high grade, non-ageing electrical silicon laminated steel of low hysteresis loss and high permeability to ensure high accuracy at both normal and with 25 % over load current.
- c. The current transformers shall be properly sealed to eliminate and prevent entry of air and moisture in the tank. For gasket ted joints, wherever used, **joint less nitrite butyl rubber gaskets, minimum thickness 3 mm** neoprene or any other improved material shall be used. The gasket shall be fitted in properly with adequate space for accommodating the gasket under compression. The bidder has to submit complete details, drawings of gaskets for 33 KV CTs, which they have provided between joints and the gasket shall be durable and of proper quality to avoid leakage of oil used for mounting oil level indicator.
- d. The CTs shall be provided with a pressure-relieving device and an explosion vent with diaphragm having a rupture pressure of 0.98 Kg/sq.cm. at suitable places with proper clearances capable of releasing abnormal internal pressures. Design and arrangement of mounting of pressure release device and adequate size of oil level gauge should clearly be indicated in drawing.
- e. The maximum temperature attained by any part of the equipment, when in service, under continuous full load conditions and exposed to direct sun rays, shall not exceed 45 degree centigrade above ambient temperature of 50 °C reached in summer.
- f. The primary winding, terminals, terminal connectors clamps etc. are required to be designed considering the continuous over loading of 25 percent. For continuous over loading, the ratio and phase angle error shall be maintained within the specified limit as per relevant ISS.
- g. The primary terminal to winding joints shall be made by using silver brazing/hydraulically crimp.

1.6 Windings:

- a. The current transformer's **First core to be used for metering** and instrument shall be of accuracy class 1.0 specified in Clause 1.2 above. The primary winding shall be designed considering current density not exceeding 2.2 Amps/Sq.mm. The saturation factor of this core shall be low enough not to cause any damage to measuring instruments in the event of maximum short circuit current.
- b. Current transformer's **Second cores to be used for protective relaying** purposes shall be of accuracy class specified or appropriate class suitable for over current protection. The cores shall be designed for a minimum saturation factor of 10 for the highest setting. The magnetization curves for these cores shall be furnished along with the drawings of CTs.
- c. The winding should be placed inside the transformer tank at least 25mm above the tank floor to protect it, as far as possible, from the moisture(water) that may gradually accumulate at the bottom over a period of time.
- d. The rating of the secondary windings shall be 5A for secondary connections, threaded studs terminal shall be provided and brought out in a compartment on one side of current transformer for easy access. Further, the secondary terminals shall be provided with short-circuiting arrangement. The secondary taps shall be adequately re-enforced to withstand normal handling without damage.
- e. Secondary terminal studs shall be provided with at least three nuts and adequate plain and spring washers for fixing the leads. The studs, nuts and washers shall be brass nickel plated. The minimum outside diameter of the studs should not be less than 6 mm. The length of at least 15 mm shall be available on the stud for inserting the leads.
- f. The secondary terminals shall be invariably marked as follows:
 - i) 1S1 and 1S2 for metering core (ii) 2S1 and 2S2 for protection core
- g. The CTs secondary terminals shall be brought out to a suitable weather proof sheet metal terminal box on side wall of the tank adjacent to the primary outgoing (P2) terminal for termination of multi-core cables. The terminal box shall be provided with one cable gland for each core, which shall be suitable for 4 core 1100 Volt grade PVC/XLPE Insulated 2.5 sq.mm. Copper control cable. The dimension of terminal box and its opening shall be adequate to enable easy access and working space with use of normal tools. The outer cover of the secondary terminal box shall have proper arrangement of sealing.

1.7 Insulation:

- a. The insulating oil filling in each CT shall be in the scope of supplier. Best quality of new EHV Grade Transformer Oil should be used with the equipment with minimum BDV of 70 KV. The test certificate of the transformer oil shall be produced at the time of inspection. The oil shall comply in all respect with the latest version of IS-335:1983.

- b. The CTs shall be single phase, multi core, and separately mounted, freestanding, type for outdoor installation.
- c. All porcelain insulators shall be prepared from wet process porcelain with arrangement for hermetically sealing of the metallic tank containing the core and the secondary winding.
- d. Adequate insulation shall be provided on primary winding to achieve maximum dielectric strength. Also adequate clearances shall be provided between the primary conductor and the metal body.
- e. The terminals of primary and secondary winding shall be clearly marked according to relevant standards.

1.8 Insulation Withstand Characteristics:-

- a. Insulation withstand characteristics of 33 KV CTs shall be as per IS:2705 as shown in the table below :-

Nominal system voltage	Highest system voltage	Power frequency withstand Voltage (for 1 minute)	Lightning Impulse withstand Voltage (for 1 minute)
33 KV (rms)	36 KV(rms)	70 KV(rms)	170 KV (peak)

- b. The exterior of the CTs tank shall be thoroughly cleaned, scraped and giving a primary coat and two coats of durable oil and weather resisting enamel paint or hot dip galvanized. All steel bolts, nuts and fasteners exposed to atmosphere, shall be hot dip galvanized conforming to IS: 2633.
- c. Change in CTs ratio will be obtained by providing tapings in the secondary windings, while the primary will have only one winding.
- d. The CTs are required for outdoor application fitted with outdoor type porcelain bushings. Compound filled bushings are not acceptable. The CTs will be dead tank design. Live tank designs CTs are not acceptable.

1.9 Type of mounting:

The CTs shall be mounted on CT bracket, provided on Circuit Breaker’s structure. Suitable sized MS channel/angles welded to the bottom of the tank must be provided for facilitating mounting of the CTs.

1.10 Terminal Connectors:

- a. The terminals of primary and secondary winding shall be clearly marked according to relevant standards and shall conform to latest version of IS: 5561 or equivalent International Standard. In respect of the terminal connector following shall be ensured:-

The primary terminals of 33 KV, CTs for transformer and line protection shall be of non-ferrous corrosion-proof material and shall be provided with suitable **pad type terminals connectors** to receive Dog Conductor.

- b. All above terminal clamps shall be designed adequately to take care of any bimetallic effect. Terminal connectors shall be tested for short circuit current capability, and temperature rise. The terminal connector shall also meet the following requirements :-
- i. Terminal connectors shall be manufactured by pressure die casting & tested as per IS:5561.
 - ii. All castings shall be free from blow-holes, surface blisters, cracks and cavities. All sharp edges and corners shall be blurred and rounded off.
 - iii. No part of the clamp shall be less than 12 mm thick.
 - iv. The nuts, bolts & washers used in the current path shall be hot dipped galvanized
 - v. The bimetallic strips/ sleeve liner of minimum thickness of 2 mm shall be made by electroplating process.
 - vi. All current carrying parts shall be designed and manufactured to have minimum contact resistance.
 - vii. Size of terminal connector for which the clamp is designed and also rated current under site conditions shall be embossed/ punched on each part of clamps, except hardware.
 - viii. The conductor shall be tightened by at least six bolts of 8/10mm diameter. Conductor hold length must not be less than 100 mm.
 - ix. The surface of clamps to be tightened by the bolts should be flat in shape, so that it may be possible to open the nuts and bolts by normal spanners. Therefore, any type of groove in the clamp body for fixing of nuts should be avoided.
 - x. The portion of clamp to hold the conductor should be flat and straight and not zig-zag in construction, at both the sides, so that heating of clamp by throttling action of current may be avoided.
 - xi. Space of at least 50% of diameter of nuts should be available after each hole at both the sides of conductor holding portion for better mechanical strength.
- c. The Tank of each CT shall be provided with two separate GI earthing terminals, which shall have **non painted** surface for making bolted connection to 50x10 mm. MS flat to be provided by the purchaser for connection to station earth mat. Suitable drawing should be submitted after award of contract for approval.

1.11 Studs:

The stud provided on the primary should invariably be made of brass which is tough and durable. Stud should have adequate cross section/diameter for carrying the rated primary current, as well as the rated short time current. The minimum required diameter of the brass studs are -

S.No.	Current Rating	Diameter of Primary stud (Min)
1	150-75/5-5A	16 mm.

The length of the primary studs available for clamping the terminals shall not be less than 50 mm. Minimum 2 nuts with a check nut and washer should be provided on upper side of stud.

1.12 Bushing:

The basic insulation level of the bushing shall be as specified and porcelain shall be homogenous and free from cavities and other flaws. This shall be so designed as to have ample insulation and mechanical strength. All insulators of identical ratings shall be inter-changeable. Only type tested insulators shall be provided in the CTs. The bidder is required to furnish type test reports of all bushings after award of contract.

1.13 Routine Tests:

The following Routine Tests shall be witnessed.

- Verification of terminal markings.
- Power-frequency withstand tests on secondary windings.
- Power-frequency withstand tests between sections.
- Inter-turn over voltage test.
- Power-frequency withstand tests on primary winding.
- Partial discharge measurement.
- Determination of errors.

DETAILED TECHNICAL SPECIFICATION OF ITEM AT SERIAL NUMBER 16

Outdoor Station Type, 33 KV, 800 Amps Isolators with Earth Switch having double break, triple pole, Single throw with turn & twist mechanism.

Make: Atlas/Universal Isolator (Indore)/GK Electricals (Bhopal)/Mahalaxmi (Bhopal)

1.1 Scope:

This specification provides for design, manufacture, testing at manufactures works, delivery of outdoor station type 33KV (Local) manual operating mechanism isolating with earthing blades and complete in all respect with bi-metallic connectors. Operating mechanism, fixing details etc. shall be as described herein.

1.2 Particular of the System:

The isolators to be provided under this specification are intended to be used on 3 phase A.C. 33KV, 50 cycles, effectively grounded system.

1.3 Standard:

The Isolator shall comply in all respects with IS: 9921 or IEC Publication No.: 129. Equipment meeting any other authoritative standard which ensures an equal or better quality than the standard mentioned above will also be accepted.

1.4 Type & Rating:

Isolators shall have three posts per phase, triple pole single throw, turn and twist mechanism, outdoor type silver plated contacts with horizontal operating blade and isolators posts arranged vertically. The isolators will be double break type. Rotating blade feature with pressure relieving contacts is necessary i.e. the isolator shall be described in detail after award of contract for approval. Isolator shall operate through 90 degree from their fully closed position to fully open position, so that the break is distinct and clearly visible from the ground level.

The equipment offered by the tenderer shall be designed for a normal current rating of 800 A for 33 KV suitable for continuous service at the system voltage specified herein.

The isolators are not required to operate under load but they must be called upon to handle magnetization currents of the power transformers and capacitive currents of bushings, bus-bars connections, very short lengths of cables and current of voltage transformers.

The rated insulation strength of the equipment shall not be lower than the levels specified in IS 9921 JEC publication No. 129, which are described in the GTP.

The 33 KV isolators are required with post insulators but with mounting structures. The isolators shall be supplied with base channels along with fixing nuts, bolts and washers for mounting on the structured.

1.5 Temperature Rise:

The maximum temperature attained by any part of the equipment when in service at site under continues full load conditions and exposed to the direct rays of Sun shall not exceed 45 degree centigrade above ambient temperature.

1.6 Isolator Insulation:

Isolation to ground, insulation between open contacts and the insulation between phases of the completely assembled isolating switches shall be capable of withstanding the dielectric test voltage specified in the GTP.

1.7 Main Contacts:

Isolators shall have heavy duty self aligning and high pressure line type fixed contacts of modern design and made of hard drawn electrolytic copper. The fixed contact should be of reverse loop type. The various parts shall be accordingly finished to ensure inter- changeability of similar components.

The fingers of fixed contacts shall be preferably in two pieces and each shall form the reverse loops to hold fixed contacts. The fixed contacts would be placed in 'C' clamp. The thickness of 'C' clamp shall be adequate. This channel shall be placed on a channel of adequate thickness. This channel shall be welded on an insulator mounting plate of 8mm thickness. The spring of fixed contact shall have housing to hold in place. This spring shall be made of stainless steel with adequate thickness. The pad for connection of terminal connector shall be of aluminum with thickness not less than 12 mm.

The switch blades forming the moving contacts shall be made from tubular section of hard drawn electrolytic copper having outer dia not less then 38 mm and thickness 3 mm. These contacts shall be liberally dimensioned so as to withstand safely the highest short circuit and over voltage that may be encountered during service. The surfaces of the contacts shall be rendered smooth and silver plated. The thickness of silver plating shall not be less than 25 microns for 33 KV. In nut shell, the male and female contact assemblies shall be of robust construction and design of these assemblies shall ensure the same.

Electro-dynamic withstands ability during short circuit without any risk of repulsion of contacts. The current density in the copper parts shall not be less than 2 Amp/sq.mm and aluminium parts shall be less than 1 Amp/sq.mm.

Thermal withstand ability during short circuit.

Constant contact pressure even when the live parts of the insulator stacks are subjected to tensile stresses due to linear expansion of connected bus bar of flexible conductors either because of temperature verification or strong winds.

Wiping action during closing and opening.

Self alignment assuring closing of the switch without minute adjustment.

The earthing switch should be provided with three sets of suitable type of fixed contacts below the fixed contacts assemblies of the main switch on the incoming supply side and the sets of moving contacts having turn and twist mechanism. These contacts shall be fabricated out of electrolytic copper for 33 KV isolators with earth switch and designed to withstand current on the line.

1.8 Operating Mechanism for 33KV Isolators:

Isolators and earthing switches shall have separate dependent manual operation. The Isolator should be provided with padlocking arrangements for locking in both end position to avoid unintentional operation. For this purpose Godrej make 5 lever brass padlocks having high neck with three keys shall be provided. The isolating distances should be visible for isolators.

The Isolators and Isolators with earth switch inclusive of their operating mechanism should be such that they cannot come out of their open or close position by gravity wind pressure, vibrations reasonable shocks or accidental touching of connecting rods of the operating mechanism. Isolators should be capable of resisting in closed position, the dynamic and thermal effects of maximum possible short circuit current at the installation point. They shall be so constructed that they do not open under the influence of the short circuit current. The operating mechanism should be of robust construction and easy to operate by a single person and conveniently located for local operation in the switchyard.

Provision for earthing of operating handle by means of 8 SWG GS wire must be made.

1.9 Pipes:

Tandem pipes operating handle shall be class B ISI marked type having atleast 24mm internal diameter for 33KV isolator. The operating pipe shall also be class B, ISI marked with internal diameter of atleast 38 mm for 33KV isolators. The pipe shall be terminated in to suitable universal type joints between the insulator bottom bearing and operating mechanism.

1.10 Base Channel:

The Isolator shall be mounted on base fabricated from steel channel section of adequate size not less than 100x50x6 mm for 33KV. To withstand total weight of isolator and insulator and also all the forces that may encounter by the isolator during services, suitable holes shall be provided on this base channel to facilitates it's mounting on our standard structures. The steel channel in each phase shall be mounted in vertical position and over it two mounting plates at least 8mm thick with suitable nuts and bolts shall be provided for minor adjustment at site.

Guaranteed Data and other Technical Particulars for 33KV Isolators:

800Amp, 33KV isolators should have technical particulars as detailed below:

**Schedule of Guaranteed Data and Other Technical Particulars
for 33KV isolators**

Sr. No.	Particulars	Guaranteed Values
1	Type, make and country of origin	
	a Name of Manufacturer & address	:
	b Make	:
	c Type	: Outdoor Station Type, double break, triple pole, Single throw with turn & twist mechanism.
	d Country of Origin	:
2	Rated Voltage (KV)	: 36
3	Maximum permissible continuous service voltage (KV)	: 33
4	Max. Continuous current rating(Amp.)	: 800 Amps.
5	Short time current rating KA(rms)	
	a For 1 second (KA rms)	: 26.4 KA for 1 second.
	b For 3 second (KA rms)	: 26.4 KA for 3 seconds
6	Rated peak short circuit current of earthing blade (KA peak)	: 62.5 KA (Initial Peak.)
7	Rated peak short circuit current (KA peak)	: 62.5 KA (Initial Peak)
8	Momentary current KA (rms)	:
9	Temperature-rise corresponding to	
	a Maximum continuous current rating at 50° C ambient.	:
	b Short time current test	
	i. For 1 second (KA rms)	:
	ii. For 3 second (KA rms)	:
10	a Maximum charging current that can be safely interrupted by the switch	:
	b Maximum capacitive current that can be safely interrupted by the switch	:
	c Maximum Transformer off load breaking capacity	:

Sr. No.	Particulars		Guaranteed Values
	d	Maximum line charging breaking capacity	:
11	No. of Poles		:
12	Number of breaks per phase		:
13	Clearance in air (minimum)		
	a	Between phases/Poles (mm)	: 1200 mm
	b	Between live parts and earth (mm)	: 508 mm
	c	Between fixed contact and blade in open position live parts and earth (mm)	:
14	Distance between centres of outer stacks of insulators (mm)		: 960 mm
15	Power frequency withstand test voltage for completely assembled switches.		
	a	Against ground	
		Dry KV.	: 75 KV
		Wet KV.	: 75 KV
	b	Across open contacts	
		Dry KV.	: 100 KV
		Wet KV.	: 100 KV
16	Impulse voltage withstand test of completely assembled switch with 1.2/50 micro second impulse wave.		
	a	Against ground KV (peak)	: 170 KV
	b	Across the open ends of the phase KV (peak).	: 195 KV
	c	Between phases KV (peak).	: 170 KV
17	Millivolt drop of Isolator with 100A. (DC):-		
	a	Before operation of Isolators:	
		i. Across terminal	
		ii. Across contact	
	b	After carrying out mutually agreed number of operations:	
		i. Across Terminal	
		ii. Across contact	
18	Particulars of the main contacts. (main switch & earthing switch)		
	a	Type:	
		i. Fixed contacts	: Reverse loop jaw type.
		ii. Moving contacts	: Tubular section of hard drawn electrolytic copper.
	b	Material	: Hard drawn electrolytic copper.
	c	Size	
		i. Fixed contacts : Main switch	:

Sr. No.	Particulars	Guaranteed Values
	ii. Fixed contacts : Earth switch	:
	iii. Moving contacts	:
d	Current density (Amps/mm ²)	
	i. Fixed contacts	: 2 Amp/mm ² (Max.)
	ii. Moving contacts	: 2 Amp/mm ² (Max.)
	iii. Current take off assy.	: 1 Amp/mm ² (Max.)
	iv. Aluminium pad.	: 1 Amp/mm ² (Max.)
e	Surface treatment and thickness	: Contacts are silver plated with thickness of surface coating not less than 25 microns.
f	Contact area.	:
g	Contact pressure	:
h	Contact support fixed contact	:
19	Current density at the minimum cross section of switch blade (Amp/mm ²) :	:
20	Number of times switches can be operated without any need for inspection.	:
21	No of operation which the switch can withstand without deterioration of contacts.	:
22	Auxilliary switches for main and earthswitch.	
a	No of contacts	:
b	Rated voltage	:
c	Test voltage	:
d	Rated current	:
e	Rated current which the auxilliary switch can break.	:
f	Type	:
23	Terminal connectors	
a	Clamp body alloy composition of LM9 or LM25 Grade	: 12 mm thk. Al.alloy
b	Bolts & nuts size, material, tensile strength.	: Size M-10, Material- Stainless steel
c	Type of washers used	: Plain Washers & Spring washers
d	Temperature-rise when carrying rated current at 50° C ambient.(° C)	:
e	Weight of each type of clamp (Kg)	:
f	Design of clamp	:
24	Nuts and Bolts.	
	i. Size, material and grade in current carrying path	: M-8 to M12 of stainless steel
	ii.Size,material and grade in other parts.	: M-8 to M12 Electro galvanised.

Sr. No.	Particulars		Guaranteed Values
25	Material and size of plate provided below and on top of insulators.	:	
26	Bearings:		
	a Material and size of bearing housing	:	C.I. (Hot dip galvanised.)
	b No. of bearings (location & size).	:	2 nos bearings provided in the housing,
	c Type of bearings	:	1 No. Thrust bearing and 1 no ball bearing.
	d Shaft dia of bearings	:	Dia 25 mm.
	e Distance between two bearings	:	100 mm (Min.)
27	Tandom pipe		
	a Size, class and no. of pipe	:	
	b No. of bearing/bush	:	
28	Down pipe size and class	:	
29	Type of Universal joints		
	a Between bearing and down pipe	:	M.S. clamp.
	b Between down pipe and operating mechanism	:	Flanges fixed with nuts and bolts are provided to clamp down pipe and operating mechanism.
30	Operating mechanism for main switch		
	a Sheet size of cubicle	:	2.60 mm Thick.
	b Make of gear	:	
	c Material of gear	:	
	d Type and grade of lubricant	:	
	e Gear Ratio	:	
	f No of revolutions required to completely open the isolator.	:	
	g Weight of gears.	:	
31	Support Insulator:		
	a Name of Manufacturer		
	b Conforming Standard		
	c Type & Rating		
	d No. of insulator per stack		
	e Cantilever Strength (kgf)		
	f Min. Creepage distance		
	g Weight of Unit (Kg)		
	h Height of unit(mm)		
	i Insulation level:		
	a)One minute Power frequency voltage with stand test (Kv.rms)		
	Dry :		
	Wet :		
	b) 1.2/50 micro-sec .Lightning Impulse voltage withstand test (Kvp)		

Sr. No.	Particulars		Guaranteed Values
32	Size of mounting channel		
33	Torque required to open the switch.	:	
34	Safety factor taken into account while designing the Isolator.	:	1.2
35	Whether separate operating mechanism provided for operation on main blade and earthing blade.	:	Yes.
36	Weight of one three pole isolating switch with earthing blade(Kg.)	:	
37	Weight of one three pole isolating switch without earthing blade (Kg.)	:	
38	Type of interlocking between isolating switch and earth switch.	:	
39	Actual dimension of the Isolating switch per phase		
40	Shipping dimension of the largest package		

DETAILED TECHNICAL SPECIFICATION OF ITEM AT SERIAL NUMBER 17

33KV Outdoor Vacuum Circuit Breaker:

Make: BHEL/ABB/CG/Schneider

1. **Scope:**

This specification covers design, manufacture, assembly, testing at manufacturer's works, packing and forwarding of 36KV Vacuum Circuit Breakers with all accessories and galvanized supporting structures for breaker mounting.

2. **Standards:**

The Circuit Breakers shall comply in all respect with the requirements of latest issue of IEC62271-100.

3. **Specific Technical Requirement:**

The equipment to be supplied under this specification is outdoor type Vacuum power circuit breakers for use in 36 kV system.

The Circuit Breaker shall have identical pole units, operated through a common shaft (gang operated) and interlinked mechanically to the common operating mechanism unit and complete with all devices including galvanized breaker supporting structures.

The circuit breaker shall have vacuum interrupters as interrupting medium, designed to provide a long contact life at all currents upto rated making and breaking current during switching operation. The vacuum interrupters should be sealed for life and shall be encapsulated by porcelain insulators for outdoor installation requirement of the circuit breakers. The offered breakers shall be suitable for outdoor operation under climatic conditions specified without any protection from sun, rain and dust storm.

The vacuum interrupters of each phase shall be housed in a separate porcelain insulator. The three identical poles shall be mounted on a common base frame and the contact system of three poles should be mechanically linked to provide three pole gang opening/closing for all type of faults.

- i. The offered equipment shall be practically maintenance free over a long period.
- ii. All mechanical parts and linkages shall be robust in construction and maintenance free, over at least 10,000 switching operations, except for lubrication of pins/articulated joints.
- iii. Similar parts shall be strictly interchangeable without special adjustment of individual fittings. Parts requiring maintenance shall be easily accessible, without requiring extensive dismantling of adjacent parts.
- iv. The circuit breaker shall be supplied complete with all auxiliary equipment, meant necessary for the safe operation, routine and periodic maintenance. All internal wiring including those of spare auxiliary contacts shall be complete and wired upto terminal blocks.
- v. The breaker shall be totally re-strike free under all duty conditions. The details of any device incorporated to limit or control the rate of rise of re-striking voltage across the circuit breaker contacts shall be stated.
- vi. The breaker shall be suitable for three phase re -closing operation.

vii. An operation counter, visible from the ground level even with the mechanism housing closed shall be provided.

4. Temperature Rise:

The maximum temperature attained by any part of the equipment when in service at side and under continuous full load conditions and exposed to the direct rays of the sun shall not exceed the permissible limits fixed by IEC.

5. Support Insulator:

The support insulator shall conform to IEC-60137. Minimum clearance between phases, between live parts and grounded objects shall be as per relevant standard and also should conform to local Electricity Rules of the user country. The minimum creepage distance for severely polluted atmosphere shall be 25 mm/KV as per IEC-815-1985.

Sharp contours in conducting parts should be avoided for breakdown of insulation. The insulators shall be capable to withstand the seismic acceleration of 0.6 g in horizontal direction and 0.6g in vertical direction.

6. Operating Mechanism and control cubicle:

The operating mechanism shall be stored energy type and capable of giving specified duty of the breaker (sequence of opening and closing) as specified under O-0.3 sec-CO-3 min-CO. The breaker shall also pass the operational test which ascertains the capabilities of operating mechanism.

The operating mechanism shall be capable to perform 10,000 operations at rated current efficiently. Operating mechanism should also be suitable for three phase auto re-close duty. The closing spring shall be automatically charged by motor immediately after closing operation. In case of failure of supply to the spring charging motor, the spring shall be chargeable by spring charging handle.

The spring charging handle shall be an integral part of the mechanism. Separate spring charging handle is not allowed since it could get misplaced at site.

The operating mechanism should have mechanical anti-pumping feature.

a) Tripping/Closing Coils:

The circuit breakers shall be provided with one trip coils and one closing coil per breaker. The trip coils should be of continuous rating to improve reliability and reduce the possibility of burning of the coils during service.

b) Trip Free Features:

The trip free mechanism shall permit the circuit breaker to be tripped by the protective relay even if it is under the process of closing. An anti-pumping device to prevent the circuit breaker from reclosing after an automatic opening shall be provided to avoid the breaker from pumping i.e., anti pumping relay should interrupt the closing coil circuit.

c) Controls:

The circuit breaker shall be controlled by a control switch located in the control cabinet. The control arrangement shall be such as to disconnect the remote control circuits of the breaker, when it is under test. Local control devices, selector switch and position indicator shall be located in weather and vermin-proof cabinet with degree of protection not less than IP-55. Local/remote selector switch shall be provided for all breakers for selection of "Local" control/remote control.

Provision shall be made for local manual, electrical and spring controls. Necessary equipment's for local controls shall be housed in the circuit breaker cabinet of weather-proof construction.

Each circuit breaker shall have a mechanical open/closed and spring charge indicator. Mechanically ON/OFF indicator, spring charged indicator and operation counter shall be provided on the front of the control cubicle.

Closing coil shall operate correctly at all value of voltage between 85 % and 110% of the rated voltage. Shunt trip coils shall operate correctly under all operating conditions of the circuit breaker upto the rated breaking capacity and at all values of supply voltage between 70% and 110% of rated voltage. The variation in A.C. supply voltage shall be -15% to +10% while variation in frequency shall be +/- 3%. Working parts of the mechanism shall be noncorrosive material. Bearings which require grease shall be equipped with pressure type fillings. Bearing pins, bolts, nuts and other parts shall be adequately pinned or locked to prevent loosening or changing adjustment with repeated operation of the circuit breaker. It shall be possible to trip the circuit breaker even in the event of failure of power supply. Operating mechanism and all accessories shall be enclosed in control cabinet.

d) Enclosure:

The enclosure shall be made out of MS sheet metal not less than 2.5 mm thick and of light section structural steel. It should be weather proof as well as vermin proof.

The enclosure shall provide protection against dust and foreign objects. Each cabinet section shall have full width and full length hinged doors mounted on the front that swing fully open. The doors shall be provided with latches to securely hold it with the cabinet.

Doors shall be of sturdy construction, with resilient material covering, fully parametrically contacting the cabinet frame to provide dust protection and prevent metal to metal contact except at the latch points.

All screws and bolts used for assembling and mounting wire and cable termination, supports, devices and other equipment shall be provided with lock washers or other locking devices. All metal parts shall be clean and free of weld splatter, rust and mill scale prior to painting. The mounting structure shall be galvanized.

e) Wiring and Cabling:

- i. Control wire shall be stranded tinned copper switchboard wire with 1.1 kV PVC insulation conforming to the requirements of relevant IEC standards.
- ii. All the control circuit and secondary wiring shall be wired completely and brought out to terminal block ready for external connections in the control cabinet. The cross-section of control wire shall not be less than 2.5 mm² copper.

7. Supporting structure:

The circuit breakers shall be supplied complete with necessary galvanized steel supporting structures, foundation and fixing bolts, etc., the galvanizing shall be as per IS. The mounting of the breaker shall be such as to ensure the safety of the operating staff and should conform to Indian Electricity Rules, 1956. Minimum ground clearance of live part from ground level shall be 3400 mm from finished ground level.

8. Vacuum Interrupter:

Each pole of the circuit breaker shall be provided with vacuum interrupter, one for each phase, hermetically sealed for life and encapsulated by ceramic insulators.

The vacuum interrupter shall be encapsulated with silicone material for long service life and avoid moisture condensation which may lead to flashover from VI's external surface. The interrupter should be such that contact gap setting is not required to be done during service life. VI with contridge cup arrangement of main contacts are not allowed.

The VI should be capable of C2 class operations and should be capable of handling fault currents upto 31.5kA for 3 secs.

9. Tests:

Type Tests:

Each circuit breaker shall comply with requirements of type tests prescribed in 62271-100

- i. Short time and peak withstand current test.
- ii. Short circuit breaking capacity and making capacity.
- iii. Capacitive current switching test: Line charging, cable charging and capacitor bank current breaking test
- iv. Dielectric test i.e., power frequency withstand and impulse withstand test
- v. Temperature rise test.
- vi. Extended Mechanical Endurance Test at ambient temperature.
- vii. Measurement of resistance of the main circuit.

Routine Tests:

Routine Tests as per IEC-62271-100 shall be carried out on each breaker in presence of purchaser's representative at manufacturer's works.

Design Rating:

Sr. No.	Description	Particulars
1	Type	Outdoor
2	Reference Standard	IEC 62271-100
3	Rated Voltage	33kV
4	Maximum (continuous) rated service voltage	36KV
5	Nominal current rating	1250A
6	Frequency	50 Hz
7	Short Time current rating	26.3kA for 3sec
8	Breaking capacity	26.3kA
9	Making capacity	65kA peak
10	Maximum Temperature rise over ambient	Within limits as per EC 62271-100
11	Dry - 1 minute power frequency withstand voltage	
	a between line terminal and grounded objects	70KV rms
	b between terminals with breaker contacts open	70KV rms
12	1.2/50 micro second full wave impulse withstand test voltage for the two cases	

	above	
	a	Between line terminals and grounded objects
	b	between terminals with breaker contacts open
13	The rating of the circuit breaker for capacitor switching	
14	Opening Time	
15	Closing Time	
16	Total creepage distance	
17	Number of poles of circuit breaker	
18	Number of breaks per phase	
19	Number of spare auxiliary contacts provided	
	a	Those closed when breaker is closed
	b	Those open when breaker is closed
20	Type of operating mechanism	
21	Control circuit voltage	
	a	Operating voltage of tripping coil
	b	Operating voltage of closing coil
22	Voltage of spring charging motor	
23	Time required for motor to charge the spring fully.	
24	Auxiliary Power Supply	
25	Paint IP Assy./ Control Cubicle	Shade
26	Structure	

Standards Applicable:

Switchgear	IEC:62271-100/IS:13118-1991/ IS:3427-1969
Statutory regulations	Meets Indian Electricity Rules 1956(Pub.1989) Clause Nos. 29, 35, 48, 51, 64A, 67 & 120.
Seismic level	Upto Zone-V as per IS:1893

Fitment Details of Vacuum Circuit Breaker:

IT.NO.	BRIEF DESCRIPTION	QTY.
1.0	VACUUM CIRCUIT BREAKER RATED: 800A, TYPE PVN-36 or equivalent Comprising:	1
1.1	Vacuum Interrupters Rating: 36kV, 25kA, 1250A.	3
1.2	Set of Porcelain Insulators for housing Vacuum interrupters & glass fiber drive rod.	3
1.3	Galvanized steel support structure complete with foundation bolts (For VCB, CT & PT)	1
1.4	Galvanized steel support structure for CTs/PTs Complete with foundation bolts & CT mounting brackets	2
1.5	3 Phase Inter-phase Assembly.	1
1.6	Motor/Manually charged, independent spring closing mechanism comprising:	1
1.6.1	Mechanical ON/OFF indicator.	1
1.6.2	Manual trip/close device.	1
1.6.3	Operation counter.	1
1.6.4	Spring charging motor & rectifier, 230VAC	1
1.6.5	Spring charging limit switch	1
1.6.6	Spring charged indicator.	1
1.6.7	Auxiliary switch with 6NO+6NC contacts.	1
1.6.8	Shunt trip coil. (Connected in parallel) - 275 W	2
1.6.9	Spring release coil. - 275 W	1
1.7	Local control panel, comprising:	1
1.7.1	Padlocks and duplicating keys	1
1.7.2	Trip/ Neutral / Close Control Switch	1
1.7.3	Space heater equipped with industrial grade switch.	1
1.7.4	Cable gland	1
1.7.5	Industrial Grade receipt able type 3 pin 15 Amps, power plug & socket with switch.	1
1.7.6	Local Remote changeover switch.	1
1.7.7	Manually operated tripping push button / lever (mechanical device convenient located to trip all three phases simultaneously)	1
1.7.8	Pistol grip circuit breaker control switch having trip/ normal close position.	1
1.7.9	Terminal boards	1
1.7.10	Spring charged indicator.	1
1.7.11	Operation counter.	1
1.7.12	Fuses /MCBs are required for AC & DC supply	1

	1.7.13	The no. of terminal provided shall be adequate enough to wire out all contacts and control circuits plus 20% spare terminal for owner's use	1
	1.7.14	Manual charging spring operating handle for maintenance	1

IT.NO.	BRIEF DESCRIPTION		QTY.
	1.7.15	Cubicle lamp with cage & switch	1
	1.7.16	Anti-Pumping Contactor/Plug-in Relay	1
	1.7.17	Gas pressure monitoring device for each pole with suitable glass window to monitor the pressure without opening of CB	1
1.8		Terminal Connectors for Dog ACSR conductor.	6
1.9		Spring charging handle.	1
1.10		MCB for AC supply	1
1.11		MCB for DC supply	1

DETAILED SPECIFICATION OF ITEM AT SERIAL NUMBER 18

11 KV Indoor H.T. Vacuum Circuit Breaker Switchboard:

Make: BHEL/ABB/CG/Schneider

This specification covers the technical requirements of three phase, 11 KV, 3 pole, front operative switchboard. The panel board shall be integrated indoor metal clad floor mounted, dead front free standing extensible sheet enclosed as per specifications.

1.1 Scope:

The scope covers the design, manufacture, testing, inspection & testing at manufacturer's works, supply, delivery, unloading at site (IIM, Indore), supervision of installation, testing and commissioning, of the metal clad, floor mounted, free standing, extendable, indoor, 11 KV vacuum circuit breaker type panel (Single Panel Board for incomer) complete with all accessories for efficient & trouble free operation as per the specifications. 11KV indoor Vacuum Breakers for use the 33/11KV primary substations under the distribution networks of IIM, Indore. The Panel will be retrofitted with the existing panel (Alstom make) of IIM Indore.

1.2 Climate Conditions:

(i)	Maximum temperature of air in shed	45°C
(ii)	Minimum temperature of air in shed	4°C
(iii)	Maximum relative humidity	95 % (The humidity some time approaches saturation point)
(iv)	Minimum relative humidity	10 %
(v)	Average number of dust-storm days per annum	40 days
(vi)	Average number of rainy days per annum	90 days
(vii)	Number of months of tropical monsoon conditions per annum	3 months
(viii)	Average annual rainfall	1250 mm
(ix)	Maximum wind pressure	150 Kg / Sq. mm
(x)	Altitude not exceeding	1000 metres
(The limit of ambient temperature shall be 45°C peak and 35°C average over a period of 24 hours)		

1.3 Codes and Standards:

The design, construction, manufacture, inspection, testing and performance of the VCB Panel shall comply all the currently applicable statutes, safety codes, provisions of the latest Indian Electricity act, Indian Electricity Rules and Regulation of statutory authorities (Chief electrical inspectorate to state government), and shall comply with latest revisions of the relevant Indian and international standards, some of which are listed below.

1. IS : 2516 - Circuit Breakers
2. IEC: 60694 - Common specifications for high-voltage switchgear and control gear standards
3. IEC: 62271 -100 - High Voltage A.C. Circuit Breakers.
4. IEC: 62271- 200 - Type Testing Of Switchgears.
5. IS : 2705 - Current Transformers
6. IS : 3705 - Voltage Transformers
7. IS: 1248, 83 - Direct acting indicating analogue electrical measuring instruments and their accessories.
8. IS:13118-1991/IEC56 - High Voltage Alternating current circuit Breaker
9. IS:12729/2004 - High-Voltage Switchgear and Control gear Standards

1.4 Technical Requirements:

1.4.1 Basic Technical Requirements:

The vacuum circuit breakers are required to meet the following basic technical requirements. (Reference standards IEC:62271 - 100 & 200 and associated standards listed in this specification.

Basic Technical Requirements

Sr. No.	Particulars	Requirements
1	Service type	Indoor
2	No. of Poles	3
3	Nominal system voltage	11 KV
4	Highest system voltage	12 KV
5	Rated short circuit breaking current (rms)	25KA
6	Rated short circuit making current (peak)	62.5KA

Sr. No.	Particulars	Requirements
7	Rated short time current withstand capability for 3 sec.	25KA(Panel)/25KA (Interrupter)
8	Rated insulation level:	
i)	One minute power frequency withstand voltage to earth (wet and dry) rms	28KV
ii)	Impulse withstand voltage to earth with 1.2/50 μ sec, wave of +ve and -ve polarity (Peak)	75KV
9	First - pole - to clear factor	1.5
10	Rated operating sequence (for auto reclosing)	O-0.3 Sec- CO-3 min-CO
11	Maximum break time	3 cycles
12	Rated out of phase breaking current	25% of the symmetrical short circuit breaking current

13	Maximum pole scatter	10 mili seconds
14	Rated Auxiliary supply for spring charge motor, lamp & heater circuit.	230V A.C
15	Rated supply voltage for trip/close coil	24V D.C
16	Minimum creepage distance (mm)	As Per IS
17	Minimum protected creepage distance (mm)	As Per IS

1.4.2 General Technical Requirements

The VCB to be supplied against this specification shall be required to control the secondary side of 33/11 KV power transformers in the primary sub-stations or the incoming 11KV feeders or the outgoing feeders in these sub-stations. The circuit breakers shall be suitable for 3 phase 50 Hz solidly grounded neutral system and shall have normal current carrying capacity and symmetrical short circuit breaking capability as mentioned hereunder.

- a. The VCB Panel shall be of the indoor, metal clad self-supported, floor mounting, drawout truck type. The cubicle shall be dust, damp and vermin proof type and should be fully interlocked. The frame-work of the cubicle shall be of bolted/welded construction. The doors shall be provided with concealed hinges. The panel shall be suitable for extension on either side.
- b. The VCB shall be three pole with stored energy, spring charged operating mechanism, re-strike free operation suitable for very low value of chopping currents under all duty conditions. Metal oxide gap less surge arresters shall be provided with pressure relieving vents and mechanical indication for the arrester failure. Parts of the breaker requiring inspection, maintenance or replacement shall be easily accessible. Circuit breakers shall be fully withdraw able type and interrupting medium shall be vacuum. VCB shall be fitted with withdraw able trolley which can be set in the following positions:
 - Plugged in
 - Withdrawn, in test
 - Withdrawn, fully isolated
- c. In test position, auxiliary circuit are connected, but power contacts are disconnected.
- d. VCB shall be motor operated, spring charged, manual independent closing and shunt trip mechanism. Breakers shall be trip free and shall have anti pumping device. The shunt trip coil, closing coil and spring charger motor shall be suitable for DC control supply. A maintenance free battery of suitable rating along with Battery charging unit shall be part of VCB panel. Alternatively, VCB panel shall be provided with a built in adequately rated power pack for the complete DC control supply.
- e. Panel shall comprise essentially two portions:-

- The fixed portion housing bus bar, current transformers, relays and instruments and other accessories.
 - The fixed portion comprising the circuit breaker with the integral carriage.
- i. The switchgear cubicle shall have structural sheet steel frame work enclosed on all the sides and top by CRCA sheet steel of minimum thickness of 2.5 mm.
 - ii. Panel shall be provided with a front access door with handle, lock and key and a removable back cover/door. The back cover/door shall be interlocked with the breaker such that the cover/door cannot be opened unless associated breaker is in 'OFF' position. Alternatively, a red colour indication lamp should be provided to glow at the back of the panel when it is in test position.
 - iii. The circuit breaker, bus bars, instrument transformers and cables shall be installed in separate compartment within the cubicle. Failure of one equipment should not affect the equipment in the adjacent compartment.
 - iv. Each cubicle shall be separated from the adjacent one by grounded sheet-steel barrier and bus sealing arrangement. Bus connection from the bus compartment to breaker compartment or bus bar compartment to cable compartment or bus compartment of adjacent panel shall be through sealed porcelain bushing with semi-conducting neoprene rubber ring. (If Applicable)
 - v. Non-deteriorating synthetic rubber gaskets preferably neoprene, without any discontinuous joints shall be provided on all mating surfaces. Sufficient number of bolts, where necessary, shall be provided so that a uniform pressure is maintained on the gasket. Switch and lamps shall be flush/semiflush mounted on hinged front door of the cubicle. The relays and meters shall be flush/semiflush mounted on the front portion of the cubicle.
 - vi. The protection devices, control components and all the other parts used on the boards shall be carefully chosen to meet the system requirements and duly standardized to permit the interchangeability, minimization of the spares and easy maintenance. The switchgear shall be designed throughout to ensure safety during operation, inspection, cleaning & maintenance. Necessary mechanical interlocks shall be provided for this purpose.
 - vii. The degree of protection to be provided by the enclosure shall be IP-4x. In case louvers are provided, they shall have brass wire mesh and filters. Pressure relief flaps shall be covered with perforated sheet having 1mm dia holes.
 - viii. Panel shall be provided with thermostat controlled space heater of adequate rating and single phase plug point with switch operated at 230 V AC, 50 Hz. Heaters shall have individual 'ON/OFF' switches, wired together & brought to easily accessible terminals in a common panel for the connection to the external supply.
 - ix. All the external bolts and nuts shall be made of steel and shall be cadmium plated or zinc passivated. Zinc plated high tensile bolts shall be used for bus bar joint.

1.5 **Bus bars & Connections:**

- i. The bus bar and connection shall be made of hard drawn electrolytic copper of rectangular cross section, liberally sized for specified current ratings. The complete lantern carriage assembly shall be hot dip galvanized after fabrication. It shall have perfect self balance arrangement so as to avoid swing and to prevent

damage to mast surface or other installed parts, during lowering/ raising operation of carriage.

- ii. The horizontal bus-bars shall run the entire length of the board & shall be of the same cross section. Stepped bus-bars are not acceptable.
- iii. The bus bars shall be sized to carry the rated continuous current under site ambient without exceeding the temperature rise specified in B.S. 159 or equivalent International Standards.
- iv. The bus bars shall be suitably supported and adequately secured to withstand the stresses developed during the system short circuit conditions.
- v. The bus bars shall have the marking, colour coding and arrangement according to the relevant IS or International Standard and shall run in a separate bus bar chamber.
- vi. Connection between the vertical bus bars and circuit breaker terminals shall preferably be fully insulated and so enclosed as not to leave any exposed live parts. It shall be possible to work on the circuit breaker outgoing connections without any danger of accidental contacts with the live connections between the vertical bus bars and the circuit breaker.
- vii. Three-phase bus bar shall be adequately insulated for unearthed system with 10% tolerance. For air-insulated switchgear, the buses & jumpers shall be provided with heat shrinkable insulating sleeves of fluidized red epoxy powder coating. All joints shall be provided with detachable cast resin fiber glass shrouds.
- viii. Fixed disconnects shall be shrouded with cast resin fibre glass mould. Bus insulation at joints shall be easily removable during periodic inspection at joints. In case of copper bus, all bus connections, joints and laps shall be silver plated. For aluminium-bus, Beleville washers shall be provided at the joints. All the connections shall be as straight as possible.
- ix. Bus bars and feeder/ jumper connection shall be sleeved with heat shrinkable raychem sleeves with adequate phase/ground clearances.

1.6 Insulation:

The insulation used shall be non-hygroscopic and shall be of adequate electrical and mechanical strength to give trouble free service during the normal operation and short circuit conditions. The insulation shall be treated suitably to withstand the tropical conditions.

1.7 Circuit Breaker:

- i. The circuit breaker shall be of 3 phase single/double break, horizontal drawout, vertical/horizontal isolation as mentioned in spec. sheet suitable for LOCAL/REMOTE operation with rupturing capacity and continuous current carrying capacity as given in the specification. The breaker shall be mounted on withdrawable truck in the single tier formation.
- ii. Circuit breakers controlling motors, if any, shall have provision to limit over voltage to the value safe for motor insulation. Over- voltage factor should be limited to 2.5, preferably by suitable breaker design. Alternatively, suitable surge diverter shall be used.
- iii. The closing coils and other auxiliary devices shall operate satisfactorily at all the voltages between 85% and 110% of the rated control voltage.

- iv. When the breaker is in closed position, a closing operation of an initiating control device shall neither result in further operation of the breaker closing mechanism nor endanger the operator.
- v. An emergency handle shall be supplied for manual operation of the breaker in case of failure of closing power. The 'CLOSE' push button provided for this purpose shall be accessible after opening the door.
- vi. Provision shall be made for the manual closing. A suitable operating handle shall be supplied, one for each board, for this purpose.
- vii. VCB shall have three positions - SERVICE, TEST & DISCONNECTED with mechanical indications. The design of breaker should be such that without opening the front access door it should be possible to pull out the breaker in disconnected position. Panel door shall remain closed even when the breaker is drawn to test position.
- viii. The breakers shall be provided with motor-operated power closing mechanism and shall include trip free (electrically and mechanically) and anti-pumping features. Motor operating mechanism shall be complete with universal motor, opening spring, closing spring and all necessary accessories to make the mechanism complete operating unit.
- ix. The motor shall be suitable for operation with voltage variation from 80% to 110% for rated voltage. Spring charging time shall be indicated in the offer. As long as the power is available to the motor, a continuous sequence of closing and opening shall be possible. After the failure of power supply to motor, at least one 'OPEN-CLOSE-OPEN' operation of the circuit breaker shall be possible. Motor shall be solely used for compressing the closing spring.
- x. Closing action of the circuit breaker shall compress the opening spring ready for tripping.
- xi. Soon after the closing spring is discharged after closing a breaker, the closing spring shall automatically be charged for the next operation.
- xii. The breaker shall be provided with shunt trip coil. Provision shall be made for mechanically tripping the breaker in case of emergency. The trip coil and other associated auxiliary devices shall be operated reliably and satisfactorily at all voltages between 70% & 110% of its rated voltage.
- xiii. Mechanical 'Test', 'Service' position and spring 'CHARGED- DISCHARGED' indicators appropriately marked shall be provided on the front of the breaker. The breaker shall also be provided with an operation counter.
- xiv. The local breaker switch with sequence interlocking device shall be mounted on the switchgear. This switch shall be a three positions spring returned to 'Normal' position switch with pistol- grip handle and with the positions marked 'OPEN-NORMAL- CLOSE'. Wherever the breaker is to be controlled from remote 'LOCAL/REMOTE', selector switch with locking device shall be provided on the switchgear.
- xv. Mechanical interlocks shall be provided to prevent:
 - A closed C.B. being isolated from inserted position into the service position.
 - Closing and opening of the C.B. in an intermediate position between 'SERVICE AND TEST'.
 - The C.B. can be racked into the service position only with the front door closed.
 - Any other interlocking feature required for safe operation.

- xvi. Automatic safety shutters shall be provided to completely cover the primary disconnects when the breaker is withdrawn. The safety shutter shall be arc resistant polyester type. It is preferable to have this transparent and of stronger design than the pressure relief flap.
- xvii. Positive earthing of the circuit breaker frame shall be maintained when it is in connected position and in all the other positions in which the safety shutter is in the open position.
- xviii. Cable earthing facility should be provided in the circuit breaker for discharging the power cable through the circuit breaker contacts in the circuit breaker drawn-out position. An integral earthing arrangement shall be preferred with necessary safety interlock both for cable side and bus side. Earthing carriage shall have the necessary P.T. and alarm device to detect the live condition before the insertion in case the integral earthing switch is not provided.
- xix. A maintenance truck/device for raising, lowering and withdrawal of the circuit breakers, when necessary shall be provided.

1.8 VCB Auxiliary Switch Contacts & Racking Switch Contacts:

- i. The circuit breaker shall be provided with six numbers of the normally open and six nos. of normally closed contacts, with the spare contacts wired to the terminal board.
- ii. The auxiliary contacts shall be suitable for inductive breaking (not less than 5 amps) at the control voltage specified. Necessary number of racking switch contacts shall also be included.

1.9 Arc Interrupting Devices:

- i. Offered panels are Internal Arc Tested for 25 kA 1 sec. The offered switchgear panel should be one which is successfully type tested for Inclination and Vibration and Seismic conditions.
- ii. The arc-interrupting devices shall be capable of interrupting satisfactorily current from zero to the rated interrupting current when used on predominantly capacitive or inductive circuits.

1.10 Current Transformers:

- i. The current transformers offered shall be as per the relevant IS/IEC standard and shall have the accuracies and outputs adequate for the protection, instrument and metering duties involved. The output shall preferably be 15VA per phase and in any case it shall not be less than that required for relaying, instruments and metering involved with sufficient margin for future additions. Tenderer shall clearly specify the output of the current transformers offered, after thorough checking and shall confirm these requirements.
- ii. The CTs for earth fault relay shall be so designed that when residually connected for earth fault protection, they are closely matched so that the spill current under full load/overload and through fault current conditions, shall be small though enough so as not to operate the earth fault relay.
- iii. The current transformers shall have a short time thermal current rating adequate for the short circuit level of the system in which they are to be used and their short time withstand time shall match the short time rating of the associated

switchgear. The short time dynamic current rating must not be less than 2.5 times the short time thermal current.

- iv. The C.T. shall be capable of withstanding a momentary open circuit on the secondary side without injurious effects.
- v. The temperature rise of the winding of the CTs when carrying rated continuous current shall not exceed the values given in the relevant standard and shall be limited by the lowest class of the insulation of either the windings itself or the surrounding medium in which it is embedded.
- vi. The C.T. shall also be secured in the position that no undue strain comes on the windings/terminals. All C.Ts shall be provided with shorting terminals and links. The test terminals with eye lugs and links shall be provided. All C.T. secondaries shall be earthed through a separate earth link on the terminal block.

1.11 Voltage Transformers:

- i. The voltage transformers (VT) shall preferably be of cast resin design and shall comply with the relevant standards. The V.T. shall be of the plug-in type, and withdraw able for isolation or maintenance. The primary and secondary disconnects shall have the pressure type contacts. It shall be mounted preferably in the breaker panel.
- ii. The secondary voltage of the V.T. shall be 110 volts. The accuracy class of the V.T. shall be 1.0. The V.T. shall preferably be of 100VA output per phase and in any case, the output shall not be less than that required for the relaying, instruments and metering duties involved with sufficient margins for future additions. The tenderer shall clearly specify the output of the V.T. offered and confirm after thorough checking.
- iii. Shutter shall be provided in the V.T. chamber so arranged that the V.T. orifices are automatically closed when the V.T. is withdrawn.
- iv. The V.T. shall be provided with fuses both on the H.V. and L.V. sides. H.V. winding shall be protected by current limiting fuses & low voltage fuses, sized to prevent the harmful effect of overload, shall be installed in all ungrounded secondary leads of the V.T.
- v. Mechanical interlocking arrangements shall be provided so that access to the high voltage fuses is gained only when the V.T. is fully isolated.
- vi. Voltage transformer shall be withdrawable type mounted in a separate compartment below the circuit breaker in the same panel. The VT shall be mounted on the separate trolley and not on the breaker trolley. Voltage transformer shall be accessible from front of panel & shall be independent of breaker position/ operation. However, due to design constraints if Line PT & Bus PT cannot be offered in separate compartment in same panel, then separate Line PT & Bus PT panel shall be offered by bidder.

1.12 Relays:

- i. The vendor shall furnish, install and co-ordinate all the relays to suit the requirements of the protection, operation and inter-lock of the equipment connected to the switchgear. All relays shall be provided in draw out and dust proof cases and shall be flush mounted type. They shall be fully tropicalized. IDMTL current relay shall generally have adjustable plug settings ranging from 50%

- to 200% in steps of 25% and time multiplier ranging from 0 to 1 (settings) in steps of 0.05.
- ii. Earth fault relay shall have a setting range of 20% to 80%. IDMTL relay shall have a characteristic with DMT of 2.2 sec. and an operating time of 3 seconds at 10 times the plug setting with multiplier of 1.
 - iii. All protective relays shall be provided with flag indicators and all relays directly tripping the breakers shall be provided with hand reset contacts in addition to the flag indicator. The flag indicators shall be suitable for external hand resetting and be mechanically interlocked to prevent from falling when the relay is subject to vibration. Hand reset relays shall be arranged for external hand resetting.
 - iv. All relays and other protective devices shall be properly graded, set and co-ordination chart showing the exact relay time and current settings etc., shall be supplied. All the calculations involved in the selection, protection and relay co-ordination shall be furnished to the purchaser for approval. Any data required in this respect will be furnished by the purchaser.
 - v. Only major relays, meters and controls have been indicated in the SLD/ Data Sheet. Any auxiliary relay, timers, switches etc as required while developing the control schematic and required for safe operation, even if these are not specifically mentioned shall be supplied by the party without any price implication.
 - vi. An exclusive Emergency Push Button (to be located in the Control room) to trip the VCB shall be wired up in the control circuit.
 - vii. Numerical under voltage relays with time delay relay including VT fuse failure relay shall be provided for Bus VTs.
 - viii. The vendor shall be solely responsible for coordinating the relay characteristics with suppliers for the proper selection of all CTs.

1.13 Instruments & Meters:

The instruments shall be of Digital type and suitable for flush mounting of 96 sq.mm. They shall be fully tropicalized and dust- tight and shall conform to the relevant standards.

1.14 Internal Wiring:

- i. The internal wiring shall be of PVC insulated cable of 1100V grade of minimum size 2.5 sq. mm copper.
- ii. All the wiring shall be marked in accordance with the relevant standard. The insulation on the conductors shall be fire- resisting numbered ferrules, reading from the terminals outwards shall be provided at both ends of all the wiring for easy identification. Interlocking type plastic ferrules shall be used.

1.15 Terminal Block:

- i. Terminal block shall be provided with means for terminating the outgoing ends of cubicle wiring and corresponding incoming tail ends of the control cables. They shall be shrouded, preferably by a transparent acrylic sheet.
- ii. The provision shall be made for accommodating 20% extra connections after wiring all the contacts, whether used or not at the terminal block.

1.16 Control Cable Termination:

Provision for termination arrangement for the control cables shall include a suitable clamp-type terminal block, removable gland plates, cable supporting arrangements, cable glands and crimping-type lugs.

1.17 Power Cable Termination:

The vendor shall supervise the termination activity which shall be carried out by other agency.

1.18 Annunciator & Alarms:

- i. The following shall be provided to indicate the various circuit conditions and these shall be placed at a suitable height. The various functions shall be as follows:
 - Circuit breaker closed.
 - Circuit breaker open.
 - Trip circuit healthy.
 - Alarm and auto trip.
 - Transformer non-trip.
 - Circuit breaker in test.
- ii. There shall be three types of alarm annunciation for switchboard as described in the following paragraphs.
 - -Auto-trip alarm scheme, which shall operate whenever any of the breakers trips on fault.
 - -Trip circuit supervision schemes, which shall operate whenever
 - there is a discontinuity in the trip coil circuit or
 - Complete disappearance of the trip supply in any of the breaker panels.
 - -Non-trip alarm scheme which will operate whenever there is a non-trip fault (e.g. Buchholz, oil temp, alarm etc.) in any of the panels.
- iii. Breaker position ON/OFF/spring Charged/Test position/Service Position shall be indicated mechanically. Following indications shall also be provided on the front of the panel
 - Breaker ‘ON’ : Red Lamp
 - Breaker ‘OFF’ : Green Lamp
 - Breaker ‘Auto Trip’ : Amber Lamp
 - Trip Circuit healthy : White Lamp
 - DC Supply Fail : Blue Lamp

1.19 Earth Bus:

- i. VCB Panel shall be provided with a continuous earth bus of copper with two end terminals to provide a high conductive path to the earth. The earth bus shall be rated to carry the 3 phase fault current for a period of 10 sec.
- ii. VCB Panel shall be earthed directly to this earth bus of copper with two end terminals to provide a high conductive path to earth.
- iii. The earthing terminal connectors including the hardware shall be provided at either end for the connection to external earth conductor.

1.20 Accessories:

- i. Secondary plug and socket assembly for testing breaker outside the housing.
- ii. Handle for manual spring charging.
- iii. Earthing truck.

1.21 Auxiliary Supply:

The bus coupler panel should be provided with one DC supply for closing and indication, one AC supply for tripping and one AC supply for space heater, indication and alarm.

1.22 Miscellaneous:

- i. The breaker shall not have any de-rating at the site ambient specified.
- ii. Five (5) no. auxiliary relays shall be included for Buchholz alarm and trip, winding temperature alarm and trip and oil temperature alarm.

1.23 Inspection & Testing:

After completion of manufacturing and prior shipment, the VCB Panel shall be inspected and tested by the representatives of Owner or Third Party Inspection Agency.

1.24 Quality Assurance:

Manufacture shall follow his standard procedures for quality assurance and control. However, said standard procedure shall be submitted to the Owner in event of order. The procedure shall be in such a form as to clearly delineate the manufacturing sequence and major inspection points and to reference manufacture's test and inspection procedures.

The Owner will inform the manufactures as to which of the inspection points and tests will be witnessed.

1.25 Painting:

Only doors and end covers shall be painted with RAL 7035 shade. All other sheets shall be pre-galvanized.

1.26 Tests

Switchgear Unit

The switchgear unit shall be completely assembled, wired, adjusted and tested for operation under similar conditions to ensure accuracy of wiring, correctness of control schemes and proper functioning of all equipment.

a) Routine test comprising of :

- i. Mechanical operation tests
- ii. Power frequency voltage test
- iii. Tests on auxiliary & control circuits
- iv. Measurement of resistance of the main circuit

Each of the following equipment shall be subjected to standard routine tests as per applicable clauses of relevant IS Specifications:

- Circuit breakers
- Bus bar assembly
- Instrument transformers
- Auxiliary relays
- Control switches and indication lamps

b) Design test

The type test certificate of similar type breaker panel with bus bar should be furnished for the following tests:

- Impulse test
- One minute power frequency voltage withstand test
- Temperature rise test
- Short time current test
- Short circuit test duties on circuit breaker
- Offered panels are Internal Arc Tested for 26.3kA 1 sec.
- The offered switchgear panel should be one which is successfully type tested for Inclination and Vibration and Seismic conditions.
- Mechanical endurance test
- Degree of protection test

1.27 Field Tests:

After installation at site, the switchgear shall be subjected but not limited to the following tests:

- i. Construction inspection
- ii. Measurement of insulation resistance
- iii. Calibration test for meters
- iv. Characteristic test for relays
- v. Electrical control, interlock and sequential operation tests.

1.28 Test Certificates:

Test certificate shall be furnished in Three (3) sets of copies.

The routine and type test certificates shall be furnished to the IIM, Indore for approval before dispatch of the equipment from the works. The approval in writing shall be required to affect the dispatch of the equipment.

The routine and type test certificates of the miscellaneous components shall also be furnished to the IIM, Indore for approval.

The report shall furnish complete identification of data including serial number of each equipment.

The routine and field test shall be arranged by the Supplier and carried out in presence of engineers of IIM, Indore or the representative of IIM, Indore.

1.29 Drawings, Data and Manuals:

After award of the contract, the successful Bidder shall submit the Three (3) sets of the following drawings for approval of the IIM, Indore.

- a) Confirmed outline dimensional drawing of the various switchgears showing the general arrangement and indicating the following:
 - Space required in the front for breaker withdrawal.
 - Control cable entry points and termination arrangement.
 - Power cable entry points and termination arrangement
 - Bus bar clearance phase to phase and phase to ground.
 - Configuration of bus bar
 - Technical detail of supporting insulator and their spacing
 - Location of instrument transformers
 - Control panel details with equipment layout
 - Terminal block details
- b) Single line diagrams of all switchgears showing instrument transformers control switches, instruments and indication, etc.
- c) Control schematic diagram of breaker showing all safety and operation interlocks, annunciation, etc.
- d) Transport/shipping dimensions with weights.
- e) Foundation and anchor bolt details including dead load and impact load.
- f) Cross-section with parts list.
- g) Cubicle wiring diagram with terminal board disposition.
- h) Technical leaflets on:
 - Circuit breaker
 - Instrument transformers

- Control switches, instruments and indicating lamps
- i) Typical type test and routine test results on identical equipment offered in the Tender.
- j) Characteristics curves of all equipment.

Any other relevant data, drawing and information necessary for review of items whether specifically mentioned or not, shall be furnished by the Bidder along with those information.

The responsibility of correctness of wiring diagram shall be with Bidder. The Employer will check the final schematic after submission. If any modification, addition or alteration is considered necessary to comply with the approved schematic drawing as stated herein above, the said modification, addition or alteration shall be carried out by the Bidder either in their works if it is before delivery, or at Site after delivery at no cost to the Institute.

Before starting manufacture of the equipment, the Bidder shall have to take approval of these design drawings from the Institute in writing. Any manufacturing done prior to approval of drawings shall be rectified in accordance with the approved drawing by the Bidder at his own cost and the equipment shall be supplied within the stipulated period. Before dispatch, the breaker panel would be inspected and tested by the IIM's representative.

SCHEDULE OF REQUIRMENTS

H.T. Vacuum Circuit Breakers Switchboard:

The New H.T. Vacuum Circuit Breaker panel for Utility-I shall comprise of **one incomer panel**, indoor type 11 KV metal clad switchboard to the following specification:

1	System	11,000 Volts, 3 phase, 3 wire, 50 Hz neutral earthed.
2	Breaking Capacity	25 kA at 11 KV
3	Situation	Indoor
4	Control	Spring Operated
5	Sequence of Panels	Left to right looking at the front of the Panel No.1 : Outgoing Feeder (11KV, 630A) to Utility-II (Existing Panel of Alstom make) Panel No. 2 : Outgoing Feeder (11KV, 630A) to Utility-I (Existing Panel of Alstom make) Panel No. 3 : Incoming Supply (11KV, 630A) at Utility-I (Existing Panel of Alstom make) Panel No. 4 : Bus coupler (11KV, 630A) (Existing Panel of Alstom make) Panel No. 5 : Incoming Supply (11KV, 630A) (New Proposed as per above tender)
6	General finish	Tropical
7	Painting	Switch gear- approved shade. Instruments & Relay - Matt. Black

8	Indicating Lamps	Circuit Breaker 'ON' - RED (1 No.) Circuit Breaker 'OFF' -GREEN (1 No.) Breaker tripped due to abnormal condition, to be provided on each panel-AMBER (1 No.) Trip Circuit Healthy Lamp (1 No.) Red, Yellow, Blue Phase lamp (1 Set) Eight (8) Window Annunciator Panel with required wiring & protective devices for Incomer (1 Set)
9	Panel No. 5	Control of incoming supply
10	Rating	630 Amp
11	Label reading	Main Incomer - Utility-I
12	Circuit Breaker	630 A rated Vacuum Circuit Breaker
13	Trip Coils	24 Volts D.C.
14	Current Transformers: (for Incomer-Panel No.5)	<ul style="list-style-type: none"> • Silica filled epoxy resin insulated, in air insulated chambers • 3- CTs 300-150A/5 + 5 Amps, 15 VA, Class 1.0 and 5 P 10 accuracy for protection and meter operation.
15	Voltage Transformer (for Incomer-Panel No.5)	1- Three phase, ratio 11 kV/ $\sqrt{3}$ /110V/ $\sqrt{3}$ cast resin insulated 100 VA per phase, Class 1.0 accuracy, withdrawable, complete with H.T. and L.T. MCB, circuit wiring.
16	Relays	<p>1- Triple Pole Numeric IDMT Type Relay similar to SPAJ-140C of ABB/Alstom/Schneider/L&T make with the 2 outer elements connected for non-directional over current and the inner element connected for non-directional earth fault protection with setting for:</p> <p style="padding-left: 40px;">Over Current : 50 - 200%</p> <p style="padding-left: 40px;">Earth fault : 20 - 80%</p> <p>1- Numeric Relay for Under voltage Protection / Over voltage Protection</p> <p>2- Numbers triple pole hand reset auxiliary check alarm numeric relay (one for annunciation and other for tripping) of Alstom/ABB/Schneider//L&T make type 'VAA-33' with associated lamp</p>
17	Instruments	<p>1- 2pole, 3 way and off Voltmeter selector switch.</p> <p>1- 96mm x 96mm digital Voltmeter scaled 0-12 kV</p> <p>1- Electronic Load Manager Instrument with communication port</p>
18	Cable Particulars	The incomer cable is 11 kV, Aluminum XLPE - 2 runs of 3 cores x 300 mm ² . Provision should be available for epoxy end sealing kit for end termination inside the cubical itself. Suitable double compression brass cable glands shall be provided. The cable entry will be from bottom to suit the site conditions.
Additional Equipment for the Switchboard		

19	Alarm Bell	One alarm bell each to be mounted for audible alarm purpose for AC & DC failure indication.
20	Switch	One push button switch for the cancellation of audible alarm.
21	Padlock and Keys	Provision for padlock shall be made for each panel.
22	Drawings	Drawings giving full and complete physical and electrical details shall be submitted for approval to IIM, Indore in 4 sets prior to take-up of production. The IIM, Indore will return two sets of approved drawings to the supplier. Full set of test results shall be provided to the IIM, Indore in 4 sets prior to dispatch. The IIM, Indore, after studying the furnished test data, shall decide whether inspection visit to the manufacturer's factory is necessary or not. Only after receiving written permission from IIM, Indore, the switchboard shall be dispatched to the project site.
23	Commissioning	The commissioning of the H.T. switchboard will be done after all the site tests are carried out. The supplier will also have to arrange for site visit (s) by their engineers at the time of commissioning at no extra cost to the owner.

3. TENDER FEE & EARNEST MONEY DEPOSIT DETAILS

- a) **Tender Fee of ₹ 1,500/- (Rupees One thousand five hundred only)** inclusive of all taxes in the form of NEFT / RTGS from Nationalized/scheduled bank in favour of Indian Institute of Management Indore, payable at Indore should be submitted.
- b) **EMD of ₹ 90,000/- (Rupees Ninety Thousand only)** in the form NEFT / RTGS from Nationalized/scheduled bank in favour of Indian Institute of Management Indore, payable at Indore, should be submitted.
- c) Micro and Small Enterprises (MSEs) firms as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) or the firms registered with the Central Purchase Organisation or the concerned Ministry or Department or Startups as recognized by Department of Industrial Policy & Promotion (DIPP) for **all these items only**, are exempted from Tender fee/EMD. However, they have to enclose valid self-attested registration certificate(s) alongwith the tender to this effect.
- d) **The bidders who seeks exemption from Tender fee/EMD as per clause no. 3 (c) above, if they withdraw or modify their bids during the period of validity, or if they are awarded the contract and they fail to sign the contract,, they will be suspended for the period of three years or as decided by the competent authority from being eligible to submit bids for contracts with the entity that invited the bids.**
- e) EMD of all unsuccessful bidders (if any) will be returned after finalization of the tender.
- f) The amount of EMD (if any) is liable to be forfeited, if the tenderer withdraws from the offer after submission of the tender or after the acceptance of the offer and fails to complete the order.
- g) No interest will be paid on the EMD (if any) deposited / remitted.
- h) The details pertaining to Tender fee/EMD (if any) are to be filled as per Annexure-I.

4. ELIGIBILITY CRITERIA

4.1 OID (Other Important Documents):

OID viz. Firm Incorporation Certificate, PAN details, GST details are to be provided.

4.2 Statutory Documents:

- a) The Bidder should give self-declaration certificate for acceptance of all terms & conditions of tender documents. A duly completed certificate to this effect is to be submitted as per the **Annexure-I**.

- b) The firm should be neither blacklisted by any Central / State Government / Public Undertaking / Institute nor is any criminal case registered / pending against the firm or its owner / partners anywhere in India. A duly completed certificate to this effect is to be submitted as per **Annexure-II**.
- c) The company should attach list of Purchase Order / Work Order where the similar type of work executed during the 7 years from the date of publication of tender as detailed below
- (I) Three similar works of 40% of the estimated cost **OR**
 - (II) Two similar works of 50% of the estimated cost **OR**
 - (III) One similar work 80% of the estimated cost

The details of the same along with supporting document are to be submitted as per the **Annexure-III**.

- d) The Annual Turnover should be at least 30% of the estimated cost during each of the previous three financial years (2015-16 to 2017-18) or (2016-17 to 2018-19). Copies of duly signed trading and profit & loss accounts / CA Certificate with UDIN are to be submitted as per the **Annexure-IV**.
- e) The firm should be OEM / Authorized Dealer / Authorized Distributer / Authorized Retailer of the Item(s) having authorization for sales. A duly completed valid certificate(s) to this effect is to be submitted.

4.3 Technical Criteria:

- a) Bidders should comply the minimum specification of the tendered item in all respect. The detailed format is attached at **Annexure-VI**. The bidder is to complete the same in all respect and submit accordingly.
- b) Queries / clarifications (if any) w.r.t. Technical Specification of items may be addressed: Project Department, IIM Indore, Tel: 0731-2439619 / 877, Email: project@iimidr.ac.in

5. FINANCIAL BID DETAILS

Financial bid i.e. BOQ given with tender to be uploaded after filling all relevant information, failing which the offer is liable for rejection. Kindly quote your offer on FOR IIM INDORE (inclusive of all taxes and charges).

Vendor should quote prices in BOQ only, offers indicating rates anywhere else shall be liable for rejection.

Note: Price / Quote shall be inclusive of all taxes and other charges including loading and unloading of the item(s) at the designated place of IIM Indore.

6. TIME SCHEDULE

S. No.	Particulars	Date	Time
a.	Date of Online Publication of Tender	18-09-2019	1730 Hrs.
b.	Bid Submission Start Date	18-09-2019	1730 Hrs.
c.	Bid Submission Close Date	03-10-2019	1500 Hrs.
d.	Closing Date & Time for Submission of EMD & Tender Fee	03-10-2019	1500 Hrs.
e.	Opening of Bids	04-10-2019	1500 Hrs.

7. AVAILABILITY OF TENDER

The tender document can be downloaded from <http://eprocure.gov.in/eprocure/app> and Institute website <https://www.iimidr.ac.in/tenders/> and be submitted only through <http://eprocure.gov.in/eprocure/app>.

8. BID VALIDITY PERIOD

The bid will remain valid for 90 days from the date of opening as prescribed by IIM Indore. A bid valid for a shorter period shall be rejected, being non-responsive.

9. BID SUBMISSION

9.1 Instruction to Bidder

Bidders are required to enrol on the e-Procurement module of the **Central Public Procurement Portal (URL: <https://eprocure.gov.in/eprocure/app>)** by clicking on the link "Online Bidder Enrolment" on the CPP Portal. **The registration is completely free of charge.**

Possession of a valid Class II/III DSC in the form of smart card / e-token is a prerequisite for registration and participating in the bid submission activities. DSCs can be obtained from the authorised certifying agencies recognized by CCA India (e.g. Sify/TCS/nCode/eMudhra etc).

Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.

Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.

The Bidders are required to log in to the site through the secured log-in by entering their respective user ID / password and the password of the DSC.

The CPP portal also has user manuals with detailed guidelines on enrollment and participation in the online bidding process. The user manuals can be downloaded for reference.

Any queries related to process of online bid submission or queries related to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The **Toll Free** contact numbers for the helpdesk are 1800 3070 2232, 7878007972 and 7878007973.

9.2 Online Bid Submission Procedure

Other Important Documents (OID): The file should be saved in a PDF version and should comprise of the following items:

1. [Packet-1](#): Duly Completed Scanned PDF of PAN Card.
2. [Packet-2](#): Duly Completed Scanned PDF of Registration Certificate Details.
3. [Packet-3](#): Duly Completed Scanned PDF of GST.

Cover-1: The file should be saved in a PDF version and should comprise of the following items:

1. [Packet-1](#): Duly Completed Scanned PDF copy of Annexure-I with transaction details for Tender Fee & EMD.
2. [Packet-2](#): Duly Completed Scanned PDF copy of Annexure-II.
3. [Packet-3](#): Duly Completed Scanned PDF copy of Annexure-III with supporting Documents.
4. [Packet-4](#): Duly Completed Scanned PDF copy of Annexure-IV with supporting Documents.
5. [Packet-5](#): Certificate of OEM / Authorized Dealer / Authorized Distributer /Authorized Retailer of the Items to be supplied.
6. [Packet-6](#): Duly Completed Scanned PDF copy of Annexure-V.
7. [Packet-7](#): Duly Completed Scanned PDF copy of Annexure-VI.

Cover-2: The BOQ should be downloaded from the website and should comprise of the following items.

1. [Packet-1](#): Financial Bids in XLS version Filled with all relevant information.

9.3 Online Submission of Tender Fee & Earnest Money Deposit (EMD)

It is also required to submit Tender Fee & EMD through NEFT or RTGS at the following account before 03-10-2019 at 1500 Hrs.

Name of Beneficiary: Indian Institute of Management Indore

Address: Rau-Pithampur Road, Indore-453556, M.P.

Account No.: 53018623445

Name of the Bank: State Bank of India

Branch Address: IIM Indore Campus

10. BID OPENING

- a) Bids will be opened on 04-10-2019 at 1500 Hrs.
- b) **Bids should be summarily rejected, if tender is submitted other than through online or original EMD & tender fee are not submitted within stipulated date / time.**

11. BID EVALUATION

Based on results of the Technical evaluation IIM Indore evaluates the Commercial Bid of those Bidders who qualify in the Technical evaluation. The Commercial Bid with the lowest price will be the highest evaluated bid.

12. PAYMENT TERMS

- a) No advance payment will be made in any case. Bills in Duplicate should be sent and the payment shall be released generally within 30 days, only after it is ensured that the items / quality of the items supplied are to the entire satisfaction of IIM Indore and completed the entire work within the stipulated delivery schedule. If any item is found defective, or not of the desired quality etc., the same should be replaced by the firm(s) immediately for which no extra payment shall be made.
- b) In case of the undelivered items till due date of supply, the penalty of 10% of the cost of undelivered item(s) will be imposed and deducted from the bill of the item(s) supplied or recovered from the EMD.

13. WARRANTY OF QUALITY AND QUANTITY

- a) The awardee shall give minimum warranty on item at Sr. No. 01 and 12 to 17 of Technical BID (Annexure-VI) as mentioned respectively.
- b) The awardee shall give warranty that all items are as per specification(s), conforming to the specified design and there are no defects in the process of manufacturing, packaging, transportation and delivery.
- c) Upon receipt of notice from IIM Indore for defective material, the firm shall replace the defective material within 30 days and free of cost at the destination. The firm shall take over the defective material at the time of their replacement. No claim whatsoever shall lie on IIM Indore for the replaced goods thereafter. If the firm fails to replace the defective goods within a reasonable period, IIM Indore may proceed to take such remedial actions as may be necessary, at the company's risk and expense.

14. LIQUIDATED DAMAGES

In case of delay in supply / replacement by the stipulated date, IIM Indore reserves the right of imposing penalty @ 0.5% per week on the value of the supplied items subject to maximum 10% of the cost of supplied items.

15. PERFORMANCE SECURITY DETAILS

- a) **For the item at Sr. No. 01 and 12 to 17** : The successful bidder have to deposit the performance security valid for **15 Months** in the form of DD / TDR / FDR / Bank Guarantee @ 10 % of the total value of order within 14 days from the date of issue of the award of order. The performance security deposit is applicable to all qualified bidders irrespective of bidders registered with MSME/NSIC etc. No interest will be paid by IIM Indore on the deposit.
- b) **For remaining items:** EMD of the successful bidders will be converted in Performance Security Deposit and the same will return back after successful completion of supplies of the ordered items. No interest will be paid by IIM Indore on the deposit.
- c) Performance Security will be refunded to the supplier, after it duly performs and completes the contract/warranty period in all respect.
- d) Performance Security will be forfeited if the firm fails to perform/abide by any of the terms or conditions of the contract.
- e) In case, the firm fails to execute the order successfully, within specified delivery period, the same goods/items will be procured from open market and the difference of cost, if any, will be recovered from Performance Security or from pending bill(s) of the defaulting firm or from both in case the recoverable amount exceeds the amount of Performance Security.
- f) In case of non-receipt of Security Deposit within the stipulated time, EMD will be converted into Security Deposit and the balance amount will be recovered from the bill submitted for the payment.

16. DELIVERY SCHEDULE

The successful bidder should execute the order within **30 days** (Item mentioned at Sr. No. 01 to 04, 07 to 11, 14 and 15 and **within 60 days** (Item mentioned at Sr. No. 05, 06, 12, 13, 16 and 17 at designated location(s) of IIM Indore from the receipt of the purchase order.

In case of any damage found, the item(s) should be replaced **at the earliest but should not be more than 30 days** at the designated location(s) of IIM Indore. The bidder has to make own arrangement for loading and unloading of the ordered items at designated location(s).

17. TERMS AND CONDITIONS

17.1 Termination for Insolvency

- a) The IIM Indore may at any time terminate the Contract by giving a written notice to the awarding firm, without compensation to the firm, if the firm becomes bankrupt or otherwise insolvent as declared by the competent Court, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the department.
- b) The courts of Indore alone will have the jurisdiction to try any matter, dispute or reference between the parties arising out of this purchase. It is specifically agreed that no court outside and other than Indore Court shall have jurisdiction in the matter

17.2 Force Majeure

- a) Should any force majeure circumstances arise, each of the contracting parties be excused for the non-fulfillment or for the delayed fulfillment of any of its contractual obligations, if the affected party within 15 days of its occurrence informs in a written form the other party.
- b) Force Majeure shall mean fire, flood, natural disaster or other acts such as war, turmoil, sabotage, explosions, epidemics, quarantine restriction, strikes, and lockouts i.e. beyond the control of either party.

17.3. Arbitration

In the event of any dispute or difference arising under this Tender, the Director, IIM Indore or his nominee is the arbitrator and the decision of the arbitration will be binding on both parties.

17.4. Other Conditions

- a) **The bidder has to upload the relevant & readable files only as indicated in the tender documents. In case of any irrelevant or non-readable files, the bid may be rejected.**
- b) IIM Indore reserves the right to accept or reject any or all the tenders in part or in full or may cancel the tender, without assigning any reason thereof.
- c) IIM Indore reserves the right to relax / amend / withdraw any of the terms and conditions contained in the Tender Document without assigning any reason thereof. Any inquiry after submission of the quotation will not be entertained.
- d) IIM Indore reserves the right to modify/change/delete/add any further terms and conditions prior to issue of purchase order.
- e) IIM Indore reserves the right to increase / decrease upto 25% of the quantities prior to issue of purchase order or during currency of the contract.

- f) IIM Indore reserves the right to place repeat order upto 100% of the quantities within a period of 12 months from the date of successful completion of purchase order at the same rates and terms subject to the condition that there is no downward trend in prices.
- g) In case the bidders/successful bidder(s) are found in breach of any condition(s) at any stage of the tender, Earnest Money shall be forfeited.
- h) Conditional tenders will not be considered in any case.
- i) In case of doubt in material, the expenditure on testing of equipment will be borne by the tenderer.
- j) IIM Indore shall not be responsible for any transaction delay i.e. non-receipt of the EMD & Tender Fee amount.
- k) Tender fees will not be refunded if the bidder does not submit the online bid on CPP portal by due date and time
- l) **IIM Indore reserves the right to place the order to overall lowest bidder or split the order to more than one bidder at the respective lowest price.**
- m) **IIM Indore may issue amendment/corrigendum to tender documents before due date of submission of bid. Any amendment/corrigendum to the tender document if any, issued by IIM Indore will be posted on CPP Portal. For the bidders, submitting bids on downloaded tender document, it is 'bidders' responsibility to check for any amendment/corrigendum on the website of IIM Indore or check for the same CPP Portal before submitting their duly completed bids.**
- n) The English version shall always prevail in case of any discrepancy or inconsistency between English version and its Hindi translation.

ANNEXURE – I

Undertaking

To
Officer (Stores and Purchase)
Indian Institute of Management Indore
Prabandh Shikhar,
Rau – Pithampur Road
Indore

Ref : - NIT No. IIMI/2019-20/32 dated 18-09-2019
(Notice Inviting Tender for Supply of Electrical Items)

Sir,

1. I /we hereby submit our bid for Supply of Electrical Items.
2. I/ We are enclosed herewith the following in favour of Indian Institute of Management Indore towards Tender Fee & EMD.

Particular	Amount	Transaction No. & Date	Bank Name	Supporting documents are to be attached along with the Annexure-I
Tender Fee (Including Tax)	₹ 1,500/-			
EMD	₹ 90,000/-			

I / We hereby reconfirm and declare that I / We have carefully read, understood & complying the above referred tender document including instructions, terms & conditions, scope of work, schedule of quantities, Penalty clause, Price / Quote shall be inclusive of all taxes and other charges including **loading and unloading** of the item(s) at the designated place of IIM Indore and all the contents stated therein.

3. I /we shall abide by all conditions set forth therein.

Thanking you

Yours faithfully,

(Authorized Signatory with Seal)

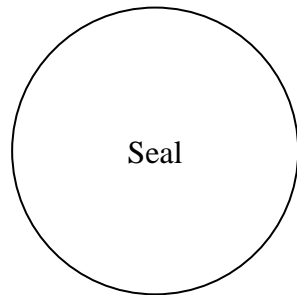
ANNEXURE – II

**CERTIFICATE
(to be provided on letter head of the firm)**

I hereby certify that the above firm neither blacklisted by any Central/State Government/Public Undertaking/Institute nor is any criminal case registered / pending against the firm or its owner / partners anywhere in India.

I also certify that the above information is true and correct in any every respect and in any case at a later date it is found that any details provided above are incorrect, any contract given to the above firm may be summarily terminated and the firm blacklisted.

Date:



Place:

Authorized Signatory

Name:

Designation:

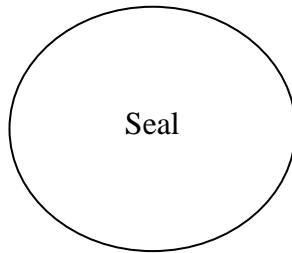
Contact No.:

ANNEXURE – III

Work Order Details:

Evaluation Criteria	Name of the Client	Order No. & Date	Amount	Remark
List of Purchase Order / Work Order where the similar type of Work executed by you during last 7 years from the date of publication of tender	1.			Supporting document are to be attached along with the Annexure-III
	2.			
	3.			
	4.			
	5.			
	6.			

Date:



Place:

Authorized Signatory

Name:

Designation:

Contact No.:

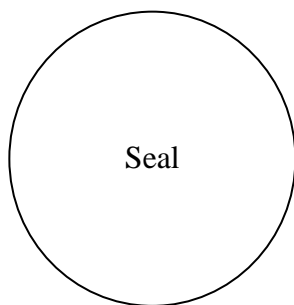
ANNEXURE – IV

Annual Turnover Details:

Evaluation Criteria			Remark
Turnover during the following last three financial years 2015-16 to 2017-18 OR 2016-17 to 2018-19	Financial Year	Turnover in Rs.	Supporting Documents are to be attached along with the Annexure-IV
	2018-19		
	2017-18		
	2016-17		
	2015-16		

Date:

Authorized Signatory:



Name:

Place:

Designation:

Contact No.:

ANNEXURE –V**COMPANY DETAILS**

Name of the Party		
Date of Incorporation / Establishment		
PAN Number		
GST Registration Number		
Bank Details	Account Number	
	IFS Code	
	Bank Name	
	Branch Name	
Office Address for Postal Communication		
Authorized Signatory Details	Name	
	Designation	
	Email	
	Phone	
Details of Contact other than Authorized Signatory	Name	
	Designation	
	Email	
	Phone	

Signature and Seal of the Tenderer:

Name in Block Letter:

Designation:

Contact no.

Date:

ANNEXURE – VI

TECHNICAL BID

Sr No	Description	UOM	Quantity	Specification	Required Make	Minimum Warranty	Complied (Yes / No)	Offered Make and Model
1	Rubber Mat checkered suitable for system voltage of 11 KV	No.	8	High Voltage Insulation Mat are relatively thin mats of thickness 3.0 mm made of elastomeric polymers material having a high Insulation resistance, thus imparting total safety of human being from any leakage current, Class-C, Thickness-3.0mm, The safe volt Synthetic Insulating Mat-confirming to IS 15652:2006 has superseded the rubber mat with IS 5424 (cold standard), Size (1mtr. x 2 mtr.)		1 Year		
2	12C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor	Mtr.	300	12C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor, XLPE insulated, colour coded as per I.S. for easy identification, cores laid up & provided with PVC inner sheath and extruded outer sheath. The extruded outer sheath shall be of Type ST 2 as per IS: 5831 -1984 and	Make: Polycab / Finolex / R R Kabel / Lapp / L&T			

				cable shall be conforming to IS: 7098/ Part-I / 88 with latest amendments and bearing ISI mark.				
3	4C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor	Mtr.	100	4C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor, XLPE insulated, colour coded as per I.S. for easy identification, cores laid up & provided with PVC inner sheath and extruded outer sheath. The extruded outer sheath shall be of Type ST 2 as per IS: 5831 -1984 and cable shall be conforming to IS: 7098/ Part-I / 88 with latest amendments and bearing ISI mark.	Make: Polycab / Finolex / R R Kabel / Lapp / L&T			
4	2C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor	Mtr.	250	2C x 2.5 sq. mm sizes of 1100 Volts grade armoured heavy duty control cable with solid/stranded annealed copper conductor, XLPE insulated, colour coded as per I.S. for easy identification, cores laid up & provided with PVC inner sheath and extruded outer sheath. The extruded outer sheath shall be of Type ST 2 as per IS: 5831 -1984 and cable shall be conforming to	Make: Polycab / Finolex / R R Kabel / Lapp / L&T			

				IS: 7098/ Part-I / 88 with latest amendments and bearing ISI mark.				
5	3 Core 300 Sqmm size of 11 KV grade armoured cable	Mtr.	300	3 Core 300 Sqmm size of 11 KV grade armoured cable with electrolytic grade Aluminium conductor as per IS:8130, conductor screen of semi-conducting compound, XLPE insulation, insulation screen of semi-conducting compound , copper tape screen, colour coded, cores laid up with Polypropelene [PP] fillers, with binder tape and extruded PVC inner sheath as per IS:5831, armoured as per IS:3975, overall ST2 FRLS PVC sheath as per IS:5831, conforming to IS:7098/ Part-II/1985 with up-to-date ammendments	Make: Universal/Polycab/Finolex/Ravi Cable/R R Kabel,			
6	3 Core 300 Sqmm size of 33 KV grade armoured cable	Mtr.	100	3 Core 300 Sqmm size of 33 KV grade armoured cable with electrolytic grade Aluminium conductor as per IS:8130, conductor screen of semi-conducting compound, XLPE insulation, insulation screen of semi-conducting compound , copper tape screen, colour coded, cores laid up with Polypropelene	Make: Universal / Polycab / Finolex / Ravin Cable / R R Kabel			

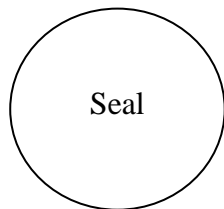
				[PP] fillers, with binder tape and extruded PVC inner sheath as per IS:5831, armoured as per IS:3975, overall ST2 FRLS PVC sheath as per IS:5831, conforming to IS:7098/Part-II/1985 with up-to-date ammendments				
7	50 mm x 5 mm EC Grade Copper strip	Mtr.	150					
8	50 mm x 5 mm Hot Dipped Galvanised Iron strip with zinc coating of 120 micron	Mtr.	800					
9	ACSR DOG Conductor	Mtr.	800	ACSR DOG Conductor as per IS - 398 (Part - II) 1996 Specification: Aluminium area (sq.mm) : Nominal - 100, Sectional - 105, Total Sectional area (Sq.mm) 118.5, Stranding & wire Diameter (Conductor (Al) - 4.72 & Conductor (Steel) 1.57, Overall Dia (mm) (Approx) 14.15, Weight mass - 394 (Al-288.3 & Steel-105.7) Kg/Km, Resistance AT 20 deg C (Ohms/Km) (Max)- 0.2792, Ultimate Breaking load (Kn)- 32.41, Current Carrying Capacity - 239 Amps (65 Deg. C) 291 (75 Deg.C).	Make : Atlas Switchgear / Jaipuria Brothers / National Switchgears / Mahalaxmi			

10	33KV (70KN) polymer Disc insulator	No.	22	33 KV Polymer Disc Insulator, refrance Standard: IEC 61109, Material of sheds: Silicon Rubber, Type of metal end fittings: SGCI/MCI, Material of sealing compound: RTV Silicon, Colour of sheds: Grey, Rated Voltage 33 KV, Highest voltage: 36 KV, Dry power frequency withstand voltage: 95 KV, Wer power frequency withstand voltage: 75 KV, Dry power frequency 130 KV, Visible Discharge Voltage (PF): 27 KV, Wet power frequency: 90 KV.	Make : Atlas Switchgear / Jaipuria Brothers / National Switchgears / Mahalaxmi			
11	33KV (10KN) polymer Pin insulator	No.	36	33 KV Polymer Pin insulator with G.I. Pin, Nominal sytem voltage 33 KV, Highest system voltage 36 KV, Power frequency: 50 HzSystem Earthing 33 KV Impedence earth,Reference Standard: IEC 61109, Material of sheds: Borrion free ECR, Material of Top End Fittings: SGCI/MCI/FORGED STEEL, Material of Bottom End Fittings: FORGED STEEL, Dry Power Frequency Withstand: 95 KV, Wet Power Frequency Withstand: 75 KV, Dry Power Frequency Flashover Voltage: 130 KV,	Make : Atlas Switchgear / Jaipuria Brothers / National Switchgears / Mahalaxmi			

12	Outdoor type 33 kV/ 3/110V/ 3 cast resin insulated 30 VA per phase potential transformer	No.	9	Please refer detailed specification given on Page No. 07 to 09	Make: Laxmi Engineering / Apoorv Electricals / Universal Isolator	1 Year		
13	Outdoor type 33KV oil immersed Current Transformer	No.	6	Please refer detailed specification given on Page No. 10 to 15	Make: Laxmi Engineering / Apoorv Electricals / Universal Isolator	1 Year		
14	33KV , 30KA Polymer Lightning Arrestors (L.A.)	No.	6		Make: Oblum / Elpro / GK Electrical / Tyco	1 Year		
15	33 KV, 800 Amps Gang operated Isolators	No.	1	Please refer detailed specification given on Page No. 16 to 23	Make: Atlas / Universal Isolator / GK Electricals / Mahalaxmi	1 Year		
16	Outdoor type 33 kV Porcelain Clad Vacuum Circuit Breaker	Set	3	Please refer detailed specification given on Page No. 24 to 30	Make: BHEL / ABB / CG / Schneider	1 Year		
17	11 KV Indoor H.T. Vacuum Circuit Breaker	Set	1	Please refer detailed specification given on Page No. 31 to 46	Make: BHEL / ABB / CG / Schneider	1 Year		

Note- The bidder has to quote only for those items for which he is having authorized OEM / Authorized Dealer / Authorized Distributer / Authorized Retailer certificate

Date:



Authorized Signatory:

Place

Name:

Designation:

Contact No.: