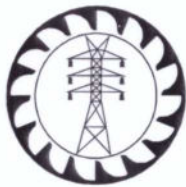


024: 2023

CEB
SPECIFICATION

36kV VOLTAGE REGULATORS



**CEYLON ELECTRICITY BOARD
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SPECIFICATION FOR 36 kV VOLTAGE REGULATORS

1.0 SCOPE

This Specification covers the general requirements of the design, manufacture, testing, supply and delivery of 36kV Three Phase Automatic Voltage Regulators.

2.0 SYSTEM PARAMETERS

(a)	Nominal voltage	33kV
(b)	System highest voltage	36kV
(c)	System frequency	50 Hz
(d)	Number of phases	03
(e)	Method of earthing	Resistively/ Effectively earthed
(f)	System fault current	14.2 kA

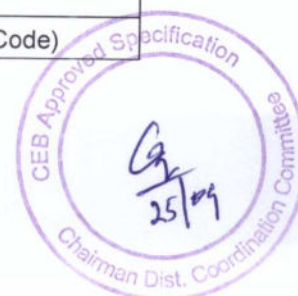
3.0 SERVICE CONDITIONS

(a)	Annual average ambient temperature	30 °C
(b)	Maximum ambient temperature	40 °C
(c)	Maximum relative humidity	90%
(d)	Environmental conditions	Humid tropical climate with heavily polluted atmosphere
(e)	Operational altitude	0 – 1000m MASL (as per IEC 60076-1).
(f)	Isokeraunic (Thunder days) level	100 days
(g)	Atmospheric corrosivity category	C5

4.0 APPLICABLE STANDARDS

The equipment and components supplied shall be in accordance with the latest editions of the standards specified below and amendments thereof.

(a)	IEC 60076-7:2018	Power transformers - Part 7: Loading guide for mineral-oil-immersed power transformers
(b)	IEC 60076-10:2016	Power Transformers - Part 10: Determination of Sound Levels
(c)	IEC 60076-21:2018	Power transformers - Part 21: Standard requirements, terminology, and test code for step-voltage regulators
(d)	IEC 60137:2017	Insulated bushings for alternating voltages above 1 000 V
(e)	IEC 60214-1:2014	Tap-changers - Part 1: Performance requirements and test methods
(f)	IEC 60214-2:2019	Tap-changers - Part 2: Application guidelines
(g)	IEC 60529:2019	Degrees of protection provided by enclosures (IP Code)



(h)	BS EN 10025:2004	Hot rolled products of structural steels
(i)	IEC 60296:2020	Fluids for electrotechnical applications – Mineral insulating oils for electrical equipment
(j)	IEC 60815-1:2008	Selection and dimensioning of high-voltage insulators intended for use in polluted conditions - Part 1: Definitions, information and general principles
(k)	ISO 12944-5:2019	Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 5: Protective paint systems

5.0 BASIC FEATURES

5.1 General

The 33KV three phase automatic voltage regulators will be used in long overhead Radial / Open-Ring Feeders to improve the downstream network supply performance. They shall be in single phase units operating in closed or open delta configuration.

The Voltage Regulators shall be mineral insulating oil immersed with ONAN cooling and suitable for outdoor plinth mounted installation. They shall have the rating stated in the Schedule of Technical Requirements and shall comply with the requirements of IEC 60076-1 and IEC 60076-7 with regard to temperature rise on all tapings and over loading.

5.2 Technical Requirements

Ref	Description	Specified Value
01	Rated Input Voltage	33 kV (Nominal) 34.5 kV (Maximum) 28 kV (Minimum)
02	Rated Output Voltage	33 kV \pm 0.3 kV
03	Regulation Range (Closed Delta)	\pm 15%
04	Regulator Current Rating	100 A
05	Over loading	As per Table-8 of IEC 60076-21
06	Type of Cooling	ONAN
07	Top Oil Temperature Rise Limit	50 °C
08	Average Winding Temperature Rise Limit	55 °C
10	Insulation level	
	(a) Impulse withstand voltage (1.2/50 μ s) kV peak	200kV
	(b) Power frequency withstand voltage (dry 1min.)	80kV
	(c) Power frequency withstand voltage (wet 10sec.)	75kV



12	Bushings	
	(a) Total Creepage Distance	900mm
	(b) Protected Creepage Distance	300mm
13	Percentage regulation	Less than 1%
14	Stand by supply source	1000VA (inverter 1 phase 50Hz 230V – Earthing suitable for TT system), With 2 X 12V, 60AH battery backup bank suitable for 30 minutes)

5.3 Duty Under Fault Conditions

- 5.3.1 Step Voltage Regulators shall be designed and constructed to withstand the mechanical and thermal stress without damage, produced by the external short circuits of 25 times the base rms symmetrical current. The maximum peak of the short circuit current that the regulator is required to withstand is equal to 2.26 times the required rms symmetrical short circuit current. The short circuit shall be for a duration of 2s to determine the thermal stresses.

5.4 Evaluation of Losses

The Bidder shall state in the Guaranteed Technical Particulars, values for component losses of the total loss which shall be as low as is consistent with transport restrictions, reliability and economic use of materials.

Bids will be assessed on the basis of the least 'Present Worth' of capital cost plus guaranteed losses, being the sum of the installed bid Price of the transformers plus:

Sri Lanka Rupees per kW of guaranteed loss	
No load loss	Load loss at CMR
2,156,377	1,154,493

5.5 Magnetic Circuit and Windings

- 5.5.1 The core shall be of high grade cold rolled grain oriented silicon sheet steel and securely clamped.
- 5.5.2 The windings shall be constructed from high conductivity E.C. grade copper. All turns of windings shall be adequately supported to prevent movement. The windings shall be of layered winding type.
- 5.5.3 The core and coil assembly shall have the core and coils rigidly connected. The core/coil assembly shall be mounted on the cover plate so that the assembly could be removed from the tank using the suitably placed lugs provided on the cover plate. All metal parts of the transformer with the exception of the individual core laminations shall be maintained at same fixed potential.



- 5.5.4 To ensure that the core and coils of transformers are seated on the floor of the tank, supporting frames shall be designed to accommodate variations in tank height. The core and coil assembly shall be rigidly connected to the tank and suitably closed lugs shall be provided for removing the core and coil assembly from the tank.

5.6 Oil

- 5.6.1 Transformers shall be filled to the required level with new, unused uninhibited and clean standard mineral insulating oil compliance with IEC 60296:2020 (for more details refer CEB specification 143:2017).

5.7 Earthing of Magnetic Circuit

The magnetic circuit shall be earthed to the clamping structure at one point only through a removable link placed in an accessible position just beneath the tank cover and which, by disconnection, will enable the insulation between the core and clamping plates, etc., to be tested at voltages up to 2.5 kV for the purpose of checking deterioration during service. The connection to the link shall be on the same side of the core as the main earth connection. These requirements are compulsory.

5.8 Tank Fabrication for Regulators

- 5.8.1 The transformer tank shall be fabricated from weldable structural steel of an approved grade to BS 4360 or equivalent and shall be of robust construction such that the transformer can be lifted and transported without permanent deformation or oil leakage.
- 5.8.2 All external joints of the transformer tank shall be seam welded. There shall be only one vertical seam weld for the fin radiator. In case of rectangular shapes, the other three vertical corner edges of the transformer shall be formed by bending. Corner ribs shall be avoided. The bearing surface of the tank to which bushings are clamped shall be substantially flat.
- 5.8.3 All matching faces of joints shall be made oil tight and finished with a smooth surface to ensure that the gasket materials make a satisfactory joint.
- 5.8.4 Flanges and covers of tanks shall be of sufficient thickness to prevent any depression occurring, which would retain water around the bolts. The horizontal edges of the cover plate shall be bent over the tank flange to facilitate water dripping out of the tank. The bent collar width shall be about 10mm to 15mm.
- 5.8.5 All the nut and bolts used shall be hot dip galvanized and spaced at sufficiently close intervals to avoid buckling of either flange or covers and shall provide reasonably uniform compression of the gasket.
- 5.8.6 Two closed lifting lugs shall be provided and the minimum diameter of the hole or width of the slot shall be 25 mm. The two lifting lugs shall be located such that there would be a minimum of 50 mm between the lifting chain and the nearest part of the bushings.
- 5.8.7 The transformer tank shall be capable of withstanding, without permanent deflection, a vacuum of 17kN/m² less than atmospheric pressure when empty of oil or the vacuum required by the recommended drying-out procedure, whichever is the greater.



5.9 Terminal Bushings

- 5.9.1 The voltage regulator shall be provided with outdoor type 36kV bushing insulators. All bushing shall comply with IEC 60137.
- 5.9.2 The bushing shall be of the oil filled type or sealed construction suitable for service under the very humid conditions. Typical section of bushing insulators showing the internal construction, method of securing the top cap and method of sealing shall be submitted with the offer.

5.10 Valves

- 5.10.1 Complete set of stainless-steel valves shall be provided for draining, sampling, filtering, air release, and isolation purposes.
- 5.10.2 Valves shall be of the sluice type, have non-rising spindles and shall be closed by turning the handwheel in a clockwise direction. They shall have machined flanges with facilities for locking in the closed and open positions.
- 5.10.3 Every valve shall be provided with an indicator to show clearly the position of the valve and each handwheel shall be fitted with a brass nameplate indicating the purpose of the valve.

5.11 Earthing Terminals

Three earthing terminals shall be provided close to the base and on opposite side of the tank structure.

5.12 Voltage Control

- 5.12.1 The voltage regulator shall have an automatic voltage control device (relay) to control the on-load tap changing type sector switch for varying the effective transformation ratio.
- 5.12.2 The auxiliary supply for the automatic voltage control relay and the OLTC shall be provided by an auxiliary winding incorporated in the regulator main winding.
- 5.12.3 OLTC shall comply with IEC 60214 and shall be suitable for power flow in both directions. Only designs which have been type tested in accordance with this standard shall be accepted.
- 5.12.4 A counter shall be included with the tap change mechanism to indicate the number of operations completed by the equipment.
- 5.12.5 All terminals shall be clearly and permanently marked with numbers corresponding to the cables connected thereto. Tap changers shall be suitable for load flow through the voltage regulator as stipulated in the technical requirements.

5.13 On-Load Tap Changers (OLTC)

- 5.13.1 On-load tap changer shall have ± 16 steps in $\frac{1}{2}\%$ increments with automatic control system. OLTC shall be contained in separate tanks mounted in an accessible position in or on the sides of the Voltage regulator main tank. Designs having the on-load tap changer contained within the main voltage regulator tank is also acceptable.



- 5.13.2 The tap selectors shall be so arranged as to permit easy access for maintenance and repair of the equipment thereon, preferably without the necessity of lowering the oil level in the main voltage regulator tank.
- 5.13.3 Current making and breaking switches integral with the tap selector equipment shall be contained in a separate tank designed in a manner to make it impossible for the oil therein to mix with oil in the tap selector and main voltage regulator. The head of oil in this tank may be maintained by a separate compartment.
- 5.13.4 The OLTC motor shall operate on 230V AC normal auxiliary supply. A suitable 2 X 12 volt & 60 AH (Min.) re-chargeable battery bank with inverter to obtain 230V 50Hz normal AC supply shall also be provided as a back up to operate OLTC operating mechanism. Automatic change over shall be provided to switch supply from the former to the latter. The latter shall bring back the tap changer to the zero position automatically during power failure. When the supply is restored, the changeover shall automatically switch to the normal auxiliary supply. The battery charger shall be provided with automatic trickle charge, float charge, and boost charge with proper protection like over charge trip, low voltage trip etc. The battery Bank and a battery charger for the above purpose shall be supplied housed in a suitable weather, vermin and insect proof cubicle with locking facilities.
- 5.13.5 During power failure the tap changer shall return to the zero position to prevent voltage rise in the downstream. The tap changer mechanism shall be inoperative when the voltage regulators are fed in the reverse direction, as this situation will arise when the voltage regulators are installed in the Open-Ring Feeders (there will be emergency back feeding requirement).
- 5.13.6 When the gas and oil actuated relay operates it shall send a signal to block the operation of the OLTC after bringing back the OLTC to the zero position.
- 5.13.7 Auto - Local - Manual selector switch shall be provided for operation of motor and the operating mechanism. Provision shall also be made available to operate the tap changer manually without the motor using a manual operating handle. The manual operating handle shall be provided and housed in the tap changer operating mechanism cubicle.
- 5.13.8 An approved means shall be provided to safeguard the voltage regulator when the tap changer mechanism fails to perform a complete tap changing operation and an indication " Tap change incomplete" shall be initiated.
- 5.13.9 A glass window shall be provided in the tap changer operating mechanism cubicle to view following.
- i) Tap position
 - ii) Tap change incomplete indication
- 5.13.10 The following operating conditions are to apply to the on-load tap selector controls: -
- a) It shall not be possible to operate the electric drive when the manual operating gear is in use.
 - b) Operation from Local control switch shall cause one tap movement only unless the control switch is returned to the off position between successive operations.
 - c) All electrical control switches (Auto- Local - Manual) and manual (hand) operating gear shall be clearly labelled in an approved manner to indicate the direction of tap changing.



5.13.11 Tap changer mechanism shall send signal to initiate Indication/Alarm for the following

- i. Tap changer in progress
- ii. Tap change incomplete
- iii. Out of Step Indication
- iv. Supply voltage failure
- v. Tap position
- vi. Tap changer counter

5.14 Oil Temperature Indicating Devices

The Oil temperature indicating device shall have a dial type indicator to indicate the oil temperature of the voltage regulator and in addition a pointer to register the highest temperature reached shall also be provided. When the pointer reached a temperature of 90°C it shall close a contact to send signal to block the operation of the OLTC after bring back the OLTC to the zero position.

5.15 Oil Level Indicator

5.15.1 Oil Level Indicator of the magnetic type shall be fitted to the conservator tank to show the oil level at all temperature likely to be experienced in service. It shall be marked with normal level at 30°C. clearly visible from normal access level.

5.15.2 The minimum indicated oil level gauge shall be with the end of the feed pipe covered with a minimum of 2.5mm depth of oil. Low oil level alarm facility shall also be provided.

5.16 Surge Arresters

5.16.1 Each single-phase voltage regulator unit shall be fitted with a bypass arrester connected across the series winding between the source and load bushings. Spare bypass arresters if required, shall be prescribed in price schedule by the procurement entity.

5.16.2 Each single-phase voltage regulator unit shall be provided with mounting arrangements to install three shunt surge arresters.

5.17 Controls

5.17.1 Each single-phase unit of Voltage Regulator shall have one control unit in a weather resistant enclosure with provision for locking.

5.17.2 The control panel shall have a degree of protection IP-54.

5.17.3 The control panel shall be constructed as a single unit and be capable of being removed from the enclosure without disconnecting components or shall be capable of being disconnected from the control cable.

5.17.4 Conductors of control cable shall be color coded or labeled for easy identification.

5.17.5 The Voltage Regulator control panel shall be fully wired and ready for service and shall include the following facilities:

- Circuit Breaker.
- Internal/External power source selector switch.
- Off/Manual/Automatic motor transfer switch with five (5) positions.



- Band-width adjustable and independent of voltage setting.
- Static time delay variable 10 seconds to 120 seconds.
- Position indicator drag hand reset button.
- Neutral position indicator light.
- Band-width position indicating meter.
- Output voltage test terminals.
- External voltage source terminals.
- Line Drop Compensation.
- Six digit operating counter.
- Current testing means.
- Supervisory On/Off switch.
- Differential voltage PTs.
- Tap position indicator.
- Profile recorder.
- Voltage limiting accessory.
- Completely ready for remote communication.
- Metering.
- Calendar/Clock.
- Load voltage primary.
- Source voltage calculation.
- System line voltage.
- Load current primary.
- Load current secondary.
- Source voltage primary.
- Source voltage secondary.
- Power factor.
- kVA load.
- kW load.
- kVAR load.
- Regulator configuration.
- Control operating mode.
- Overall potential transformer ratio.
- Current transformer primary rating.
- Reverse power flow detector.
- Reverse power sensing mode

5.17.6 A minimum five (5) meter of control cable shall be provided between the regulator and control box. The cable and controls shall be factory fitted to the regulator. The location of any plug on the cable shall be identified but should preferably be at the control panel.

5.17.7 Control/Power Voltage transformers and Current transformers shall be supplied with the Regulator.

6.0 REQUIREMENTS FOR SELECTION

6.1 Quality Assurance

The manufacturer shall possess ISO 9001:2015 or latest Quality Assurance Certification for the manufacture of transformers for the plant where the manufacture of Automatic Voltage Regulators is done. Bidders shall furnish a copy of the ISO certificate certified as true copy of the original by the manufacturer, along with the offer.



6.2 Manufacturing Experience

The bidder shall ensure that, each Automatic Voltage Regulator offered is manufactured by a manufacturer with a minimum of fifteen (15) years successful experience in manufacturing comparable equipment, in rated or higher voltage and capacity. In addition, minimum of ten years (10) experience shall be in manufacturing for orders outside the country of the manufacturer for comparable equipment.

If the offered equipment is manufactured under license, the manufacturing experience of equipment manufactured by the parent company shall not be counted as manufacturing experience of the licensee equipment.

In addition, the Bidder shall submit a reference list of two or more Automatic Voltage Regulators of same or similar design and rating manufactured and supplied by the manufacturer for orders from outside the country of the manufacture. Offered Automatic Voltage Regulator will only be accepted if transformers identical/similar in design have a minimum of five years (5) field experience.

Bidder shall provide adequate evidence of compliance to above requirements. Bids non-complying with above requirements or with incomplete evidence of compliance would be rejected.

6.3 Type Tests

Type Test Certificates conforming to the above referred standards, issued by:

Either

- (a) an accredited independent testing laboratory
- or
- (b) an accredited testing laboratory where the type test has been witnessed by an accredited independent inspection body.

shall be furnished with the offer. Type Test Certificates shall clearly indicate the relevant standard, items concerned, showing the manufacturers identity, type No. /catalogue No. and basic technical parameters.

Proof of accreditation and accredited scope, by a national/ international authority that are full members of ILAC (International Laboratory Accreditation Cooperation), i.e. signatories to the ILAC mutual recognition arrangement (MRA) to assess and accredit:

- (a) testing laboratories using ISO/IEC 17025 (in case of accredited independent testing laboratories)
- (b) inspection bodies using ISO/IEC 17020 (in case of accredited independent inspection bodies)

shall be forwarded with the offer. Accredited independent laboratory/inspection body shall not be the same entity or associate of the manufacturer.

Test certificates shall be complete including all the pages as issued by the testing authority. Type test certificates shall be in English language. Parts of test certificates shall not be acceptable.

6.3.1 Following Type Tests shall be furnished with the offer:



Type Test	Applicable Standard
Temperature rise test	IEC 60076-21
Full-wave Impulse Voltage Withstand Test, including Chopped Waves	IEC 60076-21
Noise Level Measurement	IEC 60076-10
Radio Influence Voltage Measurement	IEC-60437

6.3.2 Ability to Withstand Short Circuit

6.3.2.1 General

All transformers shall be capable of withstanding on any tapping and without damage the thermal and dynamic effects of external short circuits under the conditions stated in IEC 60076-5 Clause 4.

Manufacturer shall demonstrate the ability to withstand the thermal effect of short circuit by calculation, and the ability to withstand the dynamic effect of short circuit either by test (as per IEC60076-5 Clause 4.2) or calculation, design and manufacture considerations (as per 6.3.2.2 below). The method of demonstration of the ability to withstand the dynamic effects of short circuit shall be stated in the bid.

6.3.2.2 Calculations, Design and Manufacture Considerations

In case of proving ability of withstanding short circuit conditions by calculations, following guidelines shall be followed.

a) Thermal ability to withstand the short circuit.

Calculations shall be done according to IEC 60076-5:2006 Clause 4.1 to prove the thermal ability to withstand the short circuit, for at least 2 seconds at rated conditions and after all loading conditions as specified in IEC 60076-7 Clause 7.3.3 and shall be submitted with the offer.

b) Ability to withstand the dynamic forces

During the bidding stage manufacturer shall prove his ability of designing and manufacturing transformers similar in capacity and rated voltage not exceeding 72.5kV which can withstand dynamic effects of short circuit as per IEC 60076-5 by means of complete test reports of short circuit tests. These tests shall be conducted in a test laboratory which is a member of short circuit Testing Liaison (STL) and the laboratory shall also possess ISO/IEC17025 certification. The similarity of the reference transformer and offered transformer shall be shown/provided in compliance with Annex B of IEC 60076-5.

7.0 ADDITIONAL REQUIREMENTS

7.1 Terminal Marking

All terminal markings shall conform to the standard specified and shall be 25mm in height.



7.2 Radio Interference

When operated at voltage even up to 10% in excess of the normal system rating, transformers shall be substantially free from partial discharges (i.e. corona discharges in either internal or external insulation) which are likely to cause interference with radio or telephone communication.

7.3 Spares

A list of recommended spare parts (along with the detailed prices) for five years trouble free operation shall be furnished with the offer.

7.4 Outline Drawings, Maintenance Manual

A comprehensive maintenance manual shall be provided with each transformer, and it shall include.

- A hard cover suitable for normal handling.
- A comprehensive index of all materials in the manual.
- Instructions for the routine maintenance of the equipment and associated auxiliary equipment.
- Outline drawings and other necessary drawings baring an effect on customers' installation.
- A photograph from each side and end of the associated core and windings and of the fully erected unit. The photographs should be about 200 mm x 150 mm in size.
- Copies of routine test certificates.

8.0 INFORMATION TO BE FURNISHED WITH THE OFFER

- a) Guaranteed Technical Particulars requested in Annex – A.
- b) Constructional features and materials used for components.
- c) Separate explanatory drawings and dimensions of tap changer.
- d) Overall dimensional drawings
- e) Drawing of rating plate to scale incorporating the particulars called for.
- f) Certified copy of the quality assurance conforming to ISO 9001:2015 or latest.
- g) Documents to prove manufacturer's experience in accordance with Clause 6.2.
- h) List of spare parts.
- i) Type test certificates in accordance with clause 6.3
- j) Ability to withstand short-circuit in accordance with clause 6.3.2

9.0 INSPECTION AND TESTING

9.1 Inspection

The selected Bidder shall make necessary arrangements for inspection of the equipment by an Engineer appointed by the CEB and also to carry out in his presence necessary Acceptance / sample tests of the materials and equipment, offered.

9.2 Acceptance Tests

The following acceptance tests as per IEC 60076-21 shall be performed on all Voltage Regulators at the manufacturer's works and the tests shall be witnessed by the representative nominated by the CEB.

- Impedance and load loss at rated current and frequency.
- No-load (excitation) loss at rated voltage and frequency at all taps.
- Resistance measurement of all windings.



- Ratio test on all taps.
- Polarity and phase relation tests.
- Lightning impulse tests.
- Power frequency withstand tests.
- Induced voltage test.
- Manual and automatic operations with the Regulator fully assembled and with internal voltage supply.

10.0 ANNEXES

Annex – A : Schedule of Guaranteed Technical Particulars

Annex – B : Other Technical Requirements

Annex – C : Non-Compliance Schedule



Annex- A

SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS

(Following Information shall be furnished with the offer for the item offered)

		CEB Requirement	Offered
1.	a) Name of manufacturer		
	b) Country of origin		
	a) Brand name		
2.	Applicable standards	As per clause 4.0	
3.	Nominal system voltage	kV 33	
4.	Maximum continuous operating voltage	kV 34.5	
5.	Regulation range (closed delta)	± 15%	
6.	Current rating	A 100	
7.	Frequency	Hz 50	
8.	Cooling type	ONAN	
9.	Insulation temperature class	Class A	
10.	Average winding temperature rise (by resistance measurement) at steady state continuous MCR at annual average ambient temperature (30°C) under normal service condition.	K 55	
11.	Top oil temperature rise at annual average ambient temperature (30°C) under normal service condition.	K 50	
12.	Minimum Short circuit impedance voltage at 75°C	% As per cl. 5.0	
13.	No load Loss at 75 °C	W	
14.	Load Loss at 75 °C	W	
15.	Minimum Lightning impulse withstand voltage (peak)	kV 200	
16.	Wet power frequency withstand voltage (for transformer bushings)	kV 75	
17.	Total creepage distance of bushings		
18.	i. 33kV bushings	mm 900	
19.	ii. 11kV side bushings	mm 300	
20.	Type of Oil Level Indicator provided		
21.	Operating pressure of relief device	kN/m ²	
22.	Tap Changer		
	a) Origin / Country		



	b) Make / Model			
	c) Tap changer step	%		
	d) Number of steps			
	e) Auxiliary Supply Voltage			
	f) Whether online tap changer conforms to clause 5.13?	Yes/No	Yes	
23.	Whether controls provided as per clause 5.17?	Yes/No	Yes	
24.	Whether the offered transformers fully conform with CEB Specification?	Yes/No	Yes	
25.	Indicate the particulars of Spares to be supplied with each transformer			
26.	Whether the information as per Clause 8 is furnished with the offer?	Yes/No	Yes	
27.	Whether the complete Type Test Certificates as per Clause 6.3 are furnished with the offer?	Yes/No	Yes	
28.	Whether the report on demonstration on ability to withstand short circuit as per clause 6.3.2 is furnished with the offer?	Yes/No	Yes	
29.	Whether the Acceptance /Sample Tests as per Clause 9.2 will be carried out?	Yes/No	Yes	
30.	Place of testing			
31.	Whether the certificate of ISO 9001:2015 or latest quality Assurance furnished?	Yes/No	Yes	
32.	Total weight of oil	kg		
33.	Insulating Oil Volume/Weight	Liters/kg		
34.	Total Weight of the Voltage Regulator	kg		
35.	Whether the Complete dimensional drawing furnished?	Yes/No	Yes	

.....
Signature of the Manufacturer and seal

.....
Date

I/We certify that the above data are true and correct

.....
Signature of the Bidder and seal

.....
Date



ANNEX B: OTHER TECHNICAL REQUIREMENTS

Note: Compatibility issues with the existing SCADA system and any other technical requirements, if required have to be mentioned here by the procurement entity.



NON-COMPLIANCE SCHEDULE

On this schedule the bidder shall provide a list of non-compliances with this specification, documenting the effects that such non-compliance is likely to have on the equipment life and operating characteristics. Each non-compliance shall be referred to the relevant specification clause.

Clause No.	Non-Compliance

.....
Signature and seal of the Manufacturer

.....
Date

I/We certify that the above data are true and correct

.....
Signature and seal of the Bidder

.....
Date

