

**JAIPUR VIDYUT VITARAN NIGAM LIMITED  
OFFICE OF THE SUPERINTENDING ENGINEER (PROC)  
OLD POWER HOUSE PREMISES, NEAR RAM MANDIR, BANIPARK, JAIPUR-6**

**FAX:0141- 2208098, TELE:0141- 2208098**

**SPECIFICATION FOR SUPPLY OF 33 KV, 800 AMP. ISOLATORS WITH POST INSULATORS WITHOUT EARTH BLADE AND 11 KV ,400 AMP. ISOLATOR WITH POST INSULATORS WITHOUT EARTH BLADE. AGAINST TENDER NOTICE NO. JPD/SE(Proc)/SPO.III/TN-4333**

<b>Last Date of receipt of tenders</b>	<b>01.04.2011 upto 2:30 PM</b>
<b>Date of opening of tenders</b>	<b>01.04.2011 at 3:00 PM</b>
<b>Cost of Specification</b>	<b>Rs. 2,500.00 ( Rs. Two thousand five hundred only)</b>
<b>Validity</b>	<b>120 days from the next date of opening of techno-commercial bids.</b>
<b>Earnest Money</b>	<b>Rs. 2,00,000.00 (Rs. Two lac only) / Exemption Certificate / Vendor Registration Of Class " B " Category</b>
<b>Tendered Quantity</b>	
<b>33KV,800 Amp. Isolator with Post Insulator without E.B</b>	<b>1238 Sets</b>
<b>11KV,400 Amp. Isolator with Post Insulator without E.B</b>	<b>2160 Sets</b>

**NOTE : The bidders are advised to go through the complete specification carefully before filing the bid in their own interest.**

## INDEX

Section-I	Instructions to bidders	
Section-II	General Conditions of Contract	
Section-III	Technical Specification	
Schedule-I	Schedule of Requirement	
Schedule-II (A)	P.V. Formula for isolators ( hardware part)	
Schedule-II(B)	P.V. Formula for Post insulators( of isolators)	
Schedule-III	Details of Standards	
Schedule-III-A	Pre Qualification Requirement(PQR)	
Schedule-III-B	Performa of Bank Guarantee in lieu of type test certificates	
Schedule-IV	Price Schedule	To be submitted in Price Bid Envelop.
Schedule-IV-A	Details of tendered quantity, quantity offered alongwith justification with reference to Qualifying Requirement.	The bidder is required to justify quantity offered as per Qualifying Requirement.
Schedule V	Departure from Guaranteed Technical Particulars	
Schedule V A	Guaranteed Technical Particulars	
Schedule VI A	Departure from the requirement of Technical Specification.	
Schedule VI B	Departure from commercial terms & conditions of specification	
Schedule VII	List of Past supplies.	
Schedule VII A	C.A. Certificate for Quantity Justification	
Schedule VIII	Delivery schedule.	
Schedule IX	List of equipment & technical hands available with the tendering firm.	
Schedule X	General Particulars about the bid in brief.	

**Note:- The bidder, in their own interest, are requested to read very carefully Section-I (Instruction to bidders), Section-II (General Condition of Contract) & Section-III (Technical Specification) before filling the bid. The Bid documents be downloaded from JVVNL website [www.jaipurdiscom.in](http://www.jaipurdiscom.in) .No hard copy of the bidding documents will be provided to the bidders through this office. In case of any discrepancy found in bidding documents downloaded from the website and appended with the bid (as a bid document) and original copy of such document available in the office of Superintending Engineer (Proc.), Jaipur Discom, Jaipur then the copy available with Superintending Engineer (Proc.), Jaipur Discom, Jaipur will be considered as final document for all purpose. The cost of Bid document as published in NIT shall be furnished along with downloaded bid document in the manner prescribed in bid document.**

**SECTION -III****TECHNICAL SPECIFICATION AND OTHER REQUIREMENT FOR 33KV, 800 AMP. ISOLATORS WITH POST INSULATORS WITHOUT EARTH BLADE AND 11KV , 400 AMP. ISOLATORS WITH POST INSULATORS WITHOPUT EARTH BLADE ASSEMBLED AGAINST TN-4333****1.0 SCOPE:**

This specification covers design, manufacture, assembly testing at manufacturer's works, packing and & delivery with accessories and auxiliary equipments at site(s).store(s) of 33 KV,800 AMP. Isolators without Earth Switch with Post Insulators and 11 KV,400 AMP. Isolators without Earth Switch with Post Insulators required for installation at various 33/11KV Sub Stations and 11KV lines in Jaipur Discom. The manufacturer shall also provide design, drawing and bill of material for supporting structures for installation of their Isolators without earth switch.

It is not the intent to specify completely herein all details of the design and construction of equipments. However, the equipment shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous operation upto the supplier's guarantee acceptable to the Purchaser, who will interpret in a manner the meaning of drawings and specifications and shall have the power to reject any work or material which in his judgment is not in accordance herewith. The equipment offered shall be complete with all components necessary for its effective and trouble free operation along with associated equipments, interlocks, protection schemes etc. Such components shall be

deemed to be within the scope of supply, irrespective of whether those are specifically brought out in this specification and/or the commercial order or not. All similar parts particularly movable ones shall be interchangeable.

**2.0 CLIMATIC CONDITIONS :**

Equipment to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions :

i)	Location	Anywhere in Rajasthan
ii)	Max. ambient air temp. in shade (deg.C)	50
iii)	Min. ambient air temp. (deg.C)	(-)5
iv)	Average daily ambient air temperature(Deg.C.)	45
v)	Max. yearly weighted ambient temp.(Deg.C.)	35
vi)	Max.Relative humidity (%)	95

vii)	Average annual rainfall (mm)	100 to 1000mm (depending upon area)
viii)	No. of rainy days P.A.	70
ix)	Max. wind pressure (Kg/sq.m.)	195
x)	Max. altitude above mean sea level (metres)	815
xi)	Isoceraunic level (days/year).	4 months (June to Sept.)
xii)	Seismic level (horizontal acceleration).	0.08g

Note : Moderately hot and humid tropical climate conducive to rust and fungus growth. The climatic conditions are also prone to wide variations in ambient conditions. Smoke is also present in the atmosphere. Heavy/lightning also occurs during June to October.

### 3.0 PRINCIPAL PARAMETERS :

3.1 The equipment covered in this specification shall meet the technical requirements listed below :

S.NO.	Particulars	33 KV Isolators	11KV Isolator
A) PARTICULARS OF SYSTEM:			
i)	Nominal system voltage :KV(rms)	33	11
ii)	Highest system voltage :KV(rms)	36	12
iii)	Rated Frequency. :Hz.	50	50
iv)	Number of phases.	3	3
v)	System Neutral Earthing	Effectively earthed	Effectively earthed
B)	Service conditions	As per clause No.4.0	As per clause No.4.0
C)	Characteristics of a disconnector or earthing switch:		

The values of the Parameters/Particulars mentioned below shall not be less than the specified against each.

S.NO.	Particulars	33 KV Isolators	11KV Isolator
1.	Number of poles.	3	3
2.	Class - Indoor or Outdoor	Out door	Out door
3.	Rated voltage :KV(rms)	33	11

4. Operating mechanism	Manual	Manual
5. Type of disconnecter.(AB)	Triple pole, gang operated double break, central post rotating.	
6. Rated insulation level:		
<hr/>		
a) 1.2/50 Micro Sec. lightning impulse withstand voltage.		
<hr/>		
i) To earth & between poles: KV (Peak)	170	75
ii) Across the isolating distance.KV(Peak)	195	95
b) One minute P.F. withstand voltage.	70	28
<hr/>		
i) To earth & between poles: KV (rms)	70	28
ii) Across the isolating distance.KV(r.m.s.)	80	32
7. Rated normal current-A (rms)	800	400
8) i) Rated short time withstand current for three second. KA (rms)	25	16
ii) Rated peak withstand current: KA(Peak)	62.5	40

**3.2 SPECIFIC TECHNICAL REQUIREMENTS :**

1. Phase to Phase separation(min.) (Centre to Centre)	1200mm	760mm
2. Minimum centre to centre distance between two poles of same phase.	400mm	300mm
3. Size of base channel on which insulators are to be mounted.	100x50mm	75X40mm
4. Size of vertical operating pipe(Down pipe)		
i) Length	4.6m	6m for equipment without earth blade

ii) Nominal bore.	25 mm	25mm
5. Minimum length of operating handle.	500 mm	500mm
6. Nominal bore of phase coupling pipe.	20 mm	20mm
7. Minimum cross-sectional area of terminal pad .	500sq. mm(Min.)	50X50X4.5mm
8.(a)Minimum cross-sectional area of fixed contacts.	380 sq.mm (Min.) (95 Sq.mm.x4 Nos.)	220sq.mm(Min.) ( 55sq.mmX4 Nos.)
(b)Minimum cross-sectional area of one finger	95 sq.mm.	55 sq.mm
9. Minimum nos. of fingers in a fixed contact.	2 pairs (4 fingers)	2 pairs (4 fingers)
10. Diameter of Arcing Horn (Rod).	10 mm	8 mm
11. Size of flexible earthing connector :		
i) Minimum cross-sectional area.	-----160 sq.mm -----	
ii) Length.	-----150 mm -----	
iii) For operating handle	50 Sq.mm.x 150 mm length	
12. Name of conductor for which Electric power connector shall be suitable.	RACCOON/ DOG (As per purchaser's choice)	
13. Min. size of stainless steel spring to be provided with fixed contact.		
i) Gauge	14SWG	16SWG
ii) Outer diameter	22mm	15mm
iii) Minimum nos of turns per coil.	6 nos.	6 nos.
iv) Min. total length.	28mm	28 mm
14. Minimum number of guides to be provided for down pipe.	2 nos.	3/2 nos.
15. Minimum size of bimetallic strip to be provided between Aluminium terminal connector and copper terminal pad.	75X75X1 mm	50X50X1 mm
16. Top & bottom pitch circle diameter of post insulator	76 mm	57mm

( to be procured seperately) for which isolator hardware shall be suitable.	
17. Numbers of minimum size of bolts to be provided for fixing terminal connector with terminal pad.	4x3/8"dia 4X1/4" dia
18. Max. tempreture rise allowed above ambient tempreture of 50 degree centigrade	-----25 degree cen.-----

---

#### 4.0 GENERAL TECHNICAL REQUIREMENTS :

4.1 The Isolators shall be constructed out of best quality of material suitable for whether conditions prevailing in Rajasthan. The workmanship shall be of the highest grade and the entire manufacture shall be in accordance with the modern Engineering practices. All ferrous parts shall be given an anticorrosive finish and shall be hot dip galvanised. The other parts shall be substantially non corrosive. The bearings in the current path shall be shunted by flexible copper connectors of adequate cross section and the bearing housings shall be completely weather proof with arrangement to facilitate the lubrication of the bearings.

4.2 The Isolators shall be of tripple pole, gang operated, double break, three posts with central post rotating, banging type suitable for outdoor horizontal mounting The operating handle shall have arrangement for locking Isolators/earth switch in `ON'and `OFF' positions.

4.3 For reasons of safety, the switch isolator should be so designed that no dangerous leakage current can pass from the terminals of one side to any terminals of the other side of the switch Isolator.

4.4 The frame of each Isolator and earthing switch shall be provided with reliable earthing terminal for each phase for connection to an earthing conductor having a clamping bolt/screw of not less than 12mm diameter. The terminal shall be marked with `Earth' symbol.

4.5 The isolators shall be provided with arcing horns of fixed type with make before and break after actual making and breaking of isolator main contacts. The arcing horn shall be made of G.I. Rod and their position shall remain unchanged after mechanical endurance test (slight welding is permitted for this fabrication purpose).

4.6 All similar materials and removable parts of similar equipment shall be interchangeable with each other.

4.7 The vertical operating pipe and phase coupling pipe shall be of galvanised mild steel tube (medium class) as per IS-1161.

4.8 Suitable arrangement shall be provided to padlock the operating handle of isolating switches and earth switch in 'ON' & 'OFF' positions.

4.9 All ferrous parts shall be hot dip galvanised and uniformity of zinc coating shall satisfy requirement of IS-2633. The pipes /tubes shall be galvanised in accordance with IS-4736.

4.10 All contact surfaces shall be silver /nickel plated as per IEC:60129 and their temperature rise shall be maximum 25 degree centigrade. The current density shall be less than 2.5 Amps.per Sq.mm. in copper, or minimum cross sectional area shall be as specified.

4.11 The height of 2 x 24 KV pedestal post type(E-32) insulator (conforming to IS:5350 Part.III & IS:2544) stack to be used with 33 KV isolator hardware shall be 508 mm.

4.12 The height of 1 x 12 KV pedestal post type(E-32) insulator (conforming to IS:5350 Part.III & IS:2544) stack to be used with 11 KV isolator hardware shall be 254 mm.

#### **4.12 BASE CHANNELS :**

The channels shall be of sizes mentioned in clause No.5.0 "Principal parameters" of this specification and shall conform to IS- 808.

#### **4.13 BEARINGS :**

4.13.1 The bearing assembly for each rotating central post shall have one number taper thrust roller bearing at top & one number ball bearing at the bottom/other end of bearing housing. The entire mechanical load shall be suspended on thrust bearings. Cross sectional drawings of the bearings shall be furnished with the tender.

4.13.2 The vertical operating shaft shall be supported with taper thrust roller bearing on the top and atleast two guides in between at uniform interval alongwith its length in order to ensure smooth and easy operation.

4.13.3 A galvanised MS Angle/channel of suitable length shall be provided for fixing of fourth bearing assembly. The holes provided shall be of movable type at equal distance to that of base channel holes.

#### **4.14 OPERATING MECHANISM :**

4.14.1 The operating mechanism shall be suitable for normal operations by one man without undue efforts. The mechanism shall be so designed that all the three blades are in positive continuous control throughout the entire cycle of operation. It shall not be possible after final adjustment have been made for any part of the mechanism to be displaced at any point in the travel so as to allow improper functioning of switch, whether the switch is in opened or in closed condition.

4.14.2 All G.I. Pipes used in operating mechanism of isolators and earth switches shall be of medium class as per IS-1161.

4.14.3 The Isolators with or without earthing switches complete with the operating mechanism should not come out of its own in open or closed position due to the effect of gravity, wind pressure, vibrations, reasonable shocks or accidental touching of operating rods. The arrangement made and stoppers provided to prevent over travel shall be clearly shown in the tender drawings.

4.14.4 The Isolators should also be capable of resisting in closed position, the dynamic and thermic effects of the maximum possible short circuit current at the installation point. Their construction should be such that it should not open under the influence of short circuit current.

4.14.5 The earthing of operating handle shall be made through flexible copper strip of size as per IS:9921(Pt.III)-1982, connected to the supporting metallic structure.

#### **4.15 CONTACTS :**

4.15.1 The fixed contacts shall be of spring loaded reverse loop type as detailed in Clause No.5.2 (8&9) . The minimum length of each finger should be 105 mm or equal to type tested isolator whichever is higher for 33KV 800 Amp. isolator.

The moving contacts shall be of solid hard drawn electrolytic copper of tubular sections.

4.15.2 The contacts and switches blades shall be of liberal cross section to withstand the rated continuous current. The copper contacts shall be silver/ nickel plated as per IEC:60129 and female contacts fingers shall be provided with spring of Phosphor Bronze or stainless steel. The spring shall be fixed in the finger contacts through taflon/nylon insert at both ends so that no transfer of current is possible through spring and direct electric heating of springs is avoided.

4.15.3 The contacts must be made of liberally rated electrolytic hard drawn copper suitably plated to withstand damage on account of weather conditions prevailing at site and accidental arcing. High pressure contact switch shall be designed with a contact pressure 1/2 (Half)Lb per Amp. of capacity. The tenderer shall specifically confirm that the material components and cross sectional areas of all current carrying parts shall be either exactly same or superior to that of isolator got type tested for short circuit test, temperature rise test and Mili volt drop test as per relevant standards.

4.15.4 Full details of the contacts and switch blades shall be given with cross sectional drawings to dimension. The temperature rise of the contacts shall not exceed 25 degree centigrade at an ambient temperature 50 Degree C.

4.15.5 The current density in current carrying parts shall not exceed 2.5A per sq.mm for copper and 1.0A per sq.mm for Aluminium considering with & without holes for overlapping for which supporting calculations must be submitted with offer.

#### **4.16 TERMINAL PAD :**

The terminal pad shall be made of electrolytic copper flat and should be liberally sized, so as to receive terminal connectors through minimum 4 Nos. of nuts and bolts of suitable size.

#### **4.17 ELECTRIC POWER CONNECTORS (TERMINAL CONNECTORS) :**

4.17.1 The isolators shall be provided with 6 Nos of bimetallic rigid type universal terminal connectors of aluminium alloy suitable for conductors as per clause No.5.0. The size of terminal connector should match with terminal pad size. The terminal connector shall also be suitable for horizontal and vertical take off arrangement.

4.17.2 Thickness of bimetallic strip between terminal pad and aluminium terminal connector shall be atleast 1 mm. The current density in terminal connectors shall be less than 1.0 Amps. per Sq.mm. The connectors shall conform to all the test requirement of IS-5561 with latest amendments.

#### **4.18 BOLTS, NUTS & WASHERS :**

4.18.1 All bolts, nuts & washers required for assembling the equipment and for fixing them on to the structure shall be galvanized and shall be supplied with the equipment at no extra cost.

4.18.2 Bolts & nuts shall also be provided with lock washers and lock nuts required for fixing post insulators/post insulator stacks on base plate/base channel.

#### **4.19 ACCESSORIES AND FITTINGS :**

The following accessories and fittings shall be provided with the isolators.

- i) Handle suitable for pad locking in 'ON' & 'OFF' position.
- ii) Three earthing terminals having clamping bolts of atleast 12mm diameter.
- iii) Name Plate shall be provided on the equipment as per IS/9921.
- iv) Galvanised arcing horns of liberally rated renewable rod type with make before and break after arrangement.
- v) Mechanical interlock for earthing swithes.
- vi) Base Channels.
- vii) Electric power connectors (Terminal connectors)

#### 4.20 CLEARANCES :

The isolators shall have clearances conforming to relevant IS and should meet the requirements of the impulse voltage tests as specified therein.

4.21 The equipment covered by this specification shall be used outdoor and maximum temperature attained by any part of the equipment in service at site conditions and full load current shall not exceed the permissible limits mentioned in IS:9921 at an ambient temperature of 50 Degree C. Tenderers are required to mention specific degree of maximum temp. rise in GTPs.

4.22 The temperature rise test after fitting terminal connectors shall also be carried out as routine test on one switch isolator out of each lot offered for inspection. The limit shall not exceed those specified under this specification.

4.23 Where **Porcelain Insulators** are offered they shall be made of homogeneous and vitreous porcelain of high mechanical and dielectric strength. It shall have sufficient mechanical strength to sustain electrical and mechanical loading on account of wind load, short circuit forces etc., Glazing of the porcelain shall be of uniform brown or dark brown colour with a smooth surface arranged to shed away rain water. The porcelain shall be free from laminations and other flaws or imperfections that might affect the mechanical or dielectric quality. It shall be thoroughly vitrified, tough and impervious to moisture. The porcelain and metal parts shall be assembled in such a manner and with such material that any thermal differential expansion between the metal and porcelain parts throughout the range of temperature specified in this specification shall not loose the parts or create undue internal stresses which may affect the mechanical or electrical strength or rigidity of the unit as a whole or stack of two units. The assembly shall not have excessive concentration of electrical stresses in any section or across leakage surfaces. Cement used in the construction of post insulators shall not cause fracture by expansion or loosening by construction and proper care shall be taken to locate correctly the individual parts during cementing. The cement used shall not give rise to chemical reaction with metal fittings and its thickness shall be uniform. The insulator shall be suitable for water washing by rain or artificial means in service condition. Profile of the insulator shall also conform to the relevant IS.

4.24 Cap to be provided on top of the insulator shall be of high grade cast iron or malleable steel casting. It shall be machine faced and hot dip galvanised. The cap of 24KV Post Insulators shall have four numbers of tapped holes spaced on a pitch circle diameter of 76mm . The threads of the tapped holes in the post insulator metal fittings shall be cut after giving anti corrosion protection and shall be protected against rust by greasing or other similar means, all other threads shall be cut before giving anticorrosion protection and shall conform to IS: 4218 with latest version thereof The tapped holes shall be suitable for bolts with threads having anticorrosive protection.

The effective depth of threads shall not be less than the nominal diameter of the bolt. The cap shall be so designed that it shall be free from visible corona.

4.25 The casting shall be free from blow holes, cracks and such other defects.

4.26 All the ferrous metal parts shall be given an anticorrosive finish and shall be hot dip galvanised smoothly as per IS:3638 (as amended upto date), IS:2633 or any other equivalent authoritative standard. The other parts shall be substantially non corrosive. The material shall be galvanised only after shop operations upon it have been completed. The metal parts before galvanising should be thoroughly cleaned of any paint, grease, rust, scales or alkali or any foreign deposit which are likely to come in the way of galvanising process. The coating on the metal parts shall withstand minimum four one minute dips in copper sulphate solution as per the relevant IS.

4.27 The insulator unit shall be assembled in a suitable jig to ensure correct positioning of the top and bottom metal fittings relative to one another. The faces of the metal fittings shall be parallel and at right angles to the axis of the insulator and the corresponding holes in the top and the bottom metal fittings shall be in a vertical plane containing the axis of the insulator.

4.28 It shall be the sole responsibility of the Supplier to carry out thorough inspection and quality checks on the insulators at the insulator supplier's works, before offering the isolators for Purchaser's inspection.

4.29 The porcelain and hardware surface coming in contact with cement shall be coated with bituminous paint for cushioning to relieve mechanical stress caused by temperature variation and cement expansion.

4.30 The post insulators shall conform to IS:5350. The total creepage distance of 24KV post insulator as individual unit shall be minimum 430mm .

4.31 Following makes of the Post Insulators shall be acceptable for the supply of 33 KV & 11 KV Isolators

- i) M/s.Jaipur Glass & Potteries, Jaipur.
- ii) M/s.India Potteries, Kolkata.
- iii) M/s.Bikaner Ceramics, Bikaner.
- iv) M/s.CJI Porcelain, Khurja.
- v) M/s.Vishal Melleable, Ankeleshwar.
- vi) M/s.Allied Ceramics Pvt. Ltd., Kolkata.
- vii) M/s.WSI, Chennai.
- viii) M/s.IEC, Bhopal.
- ix) M/s.MIL, Allahabad.
- x) M/s.Jay Shree Insulators, Vadodara.
- xi) M/s.Birla NGK Insulators Pvt. Ltd., Halol.
- xii) M/s.MIL, Abu Road.
- xiii) M/s.Sarvana Insulators Ltd., Kurinji Padi, Dist Cuddalore, (Tamilnadu).
- xiv) M/s BHEL

4.32 Besides above, the Post Insulators manufactured by the vendors approved by the Power Grid Corporation of India Ltd (PGCIL) and National Thermal Power Corporation (NTPC) shall also be acceptable.

## 5.0 **TESTS :**

**5.1 TYPE TEST** The following type tests is to be conducted on the dis-connector along with insulators and terminal connectors.

1. Short time withstand current test -

The test is to be carried out as per provisions of IS:9921 (Part.IV). As per clause No. 3.0.2 of (Part.IV). The test carried out on one type of disconnector will be applicable for different current and voltage ratings but with similar components i.e. reverse loop type fixed contacts, tubular moving contact, double break mechanism with similar post insulator. However as per clause No. 3.3.1.1 of IS:9921 (Part.IV) the isolator subjected to type tests shall be atleast favorable conditions of electro magnetic forces than offered isolator for which necessary calculations may be submitted along with offer.

2. High Voltage test –

The type tested isolator shall have lower or equal clearances than offered isolator i.e. for phase to phase clearance, phase to earth clearance and clearance for isolating distance.

- a) Lightning impulse voltage test.
- b) Power frequency voltage withstand test.

3. Temperature rise test.

4. D.C. voltage drop test or measurement of resistance of main circuit.

5. Short time withstand current test on terminal connectors either as per provisions of IS:5561 or tested along with isolator.

6. Mechanical endurance test.

7. Short time withstand current test on earth switch or the offered design should have same cross section area of contacts to main contacts.

### **TYPE TEST FOR POST INSULATORS :-**

- 1. Visible discharge test.
- 2. Impulse voltage withstand test on post insulators.
- 3. Dry and wet power frequency voltage withstand test on post insulators.
- 4. Temperature cycle test.
- 5. Test for mechanical strength.
- 6. Puncture test
- 7. Porosity test.
- 8. Galvanizing test.

However, the purchaser reserves the right to demand repetition of some or all the type tests in presence of purchaser's representative. For this purpose , the tenderer

should indicate unit rate for carrying out such type tests. These test charges shall not be taken into consideration for bid evaluation.

During type tests the disconnecter shall be mounted on its own support structure or equivalent support structure and installed with its own operating mechanism to make the type tests representative.

**5.2** The manufacturer is required to conduct following routine tests as per relevant IS on the Isolators complete with required Post Insulators at manufacturer's works .

**ROUTINE TEST :**

1. Routine mechanical test on post insulators.
2. Routine electrical tests on post insulators.
3. Tests as per IS:2633.

**5.3(a) ACCEPTANCE TESTS :**

The following tests shall be got conducted in presence of purchaser's representative as per relevant standards at the place of manufacturer before despatch without any extra charges. The tests at Sr. No.1 to 6 are to be carried out on completely assembled isolator as per IS:9921(Pt.IV). The sampling for the inspection of completely assembled isolators, offered for final inspection shall be on 10% of offered quantity(unless otherwise specified). The tests at Sr. No.7 to 12 are to be carried out on Post insulators as per IS:2544 and sampling will also be as per same IS, at original manufacturer's works.

1. Measurement of resistance of main circuit of Isolator as per IS:9921 (Part.IV).
2. Mechanical operating test on atleast one sample selected at random from each type & rating.
3. Mechanical endurance test shall be done as acceptance test on one Isolator of each type & rating from every lot. Mechanical endurance test shall be conducted on the main switch as well as earth switch of one disconnector of each type & rating. Bare contacts shall not be acceptable in any case.
4. Verifications of dimensions as per approved drawing on one Isolator set of each type & rating.
5. Temperature rise test on one set of Isolator of each rating from the offered lot.
6. Preece Test on one Isolator of each type and voltage rating as per relevant IS.
7. Verification of dimensions of post insulators.
8. Temperature Cycle Test on post insulators.
9. Mechanical strength Test on post insulators.
10. Puncture Test on post insulators.
11. Porosity Test on post insulators.
12. Galvanizing Test on post insulators.

**5.3(b) TEST ON BOUGHT OUT ITEMS**

Tests are not required to be performed on bought out equipments like terminal connectors etc. at the works of manufacturer except operational tests. Furnishing Test Certificate of Isolators and Post Insulators from the original equipment manufacturers

shall be deemed to be satisfactory evidence. Inspection of the tests at Sub-contractors works will be arranged by the supplier whenever required.

**5.4 TYPE TEST ON SAMPLES SELECTED FROM MATERIAL RECEIVED IN STORES FROM 1<sup>st</sup> OFFERED LOT (Applicable to Successful bidders, who have not furnished valid Type Test(s) with bid, but furnished B.G. in lieu of Type Test(s))**

**5.4.1** The first lot offered shall not be less than 10 % of the ordered qty.

**5.4.2** If the bidder has already got conducted the requisite type test from the first lot of material received in Nigam's store against any previous / earlier tender of JVVNL and such Type Test reports are valid i.e not older than 3 years on the date of opening of Techno-Commercial Bids, then the requirement of conducting Mandatory Type Test on the sample selected from 1<sup>st</sup> Lot of supply received in Nigam's store is **RELAXED**. For this purpose date of conducting type test will be considered.

**ALTERNATIVELY**

In case the bidder do not meet above requirement than one sample of each type of Isolators from the 1<sup>st</sup> lot of received in purchaser's store shall be selected and sealed in the presence of representative of supplier for getting it Type Tested at Govt. / Govt. approved / Govt. recognized / NABL accredited Laboratory / ILAC Accredited.

**5.4.3** However, suppliers own lab shall not be considered for the purpose of type test reports. The selected and sealed sample for type test shall be identified by providing **Polycarbonate seals**. The transportation charges of sample from store to test house shall be borne by NIGAM, Whereas the charges incurred towards type test of the material at test house shall be borne by the supplier. The testing charges should be remitted through D.D. in favour of Test House. The name of the test house shall be intimated separately..

**5.4.4 In case sample(s) from first lot fails in type tests then:**

a) Supplier shall have to replace the full quantity of the respective inspected lot supplied to various stores which is lying unused.

**b) For the quantity already utilized against the order in field, a deduction of 30% (thirty percent) of F.O.R. destination price of the material supplied shall be made.**

c) Sample(s) from next lot shall be selected again for type test . All test charges incurred towards type test of the material for second time shall be borne by the Supplier for which the testing charges should be remitted through D.D. in favour of the Test House by the supplier with the 2nd inspection offer.

**5.4.5 In case sample again fails in the type test then:**

a) The quantity supplied/received in stores and lying unused in stores shall stand rejected and shall be lifted back by the supplier.

**b) For the quantity already utilized against the order in field, a deduction of 30% (thirty percent) of F.O.R. destination price of the material supplied shall be made.**

c) Further supplies shall not be accepted and order shall stand cancelled .

The various type tests as per relevant standards shall be conducted on each type of Isolator.

## **5.5 TOLERANCE :**

Tolerance shall be allowed as per respective/ relevant standards un-less otherwise specified. However, in case of current carrying parts only following negative tolerances shall be permissible :

i) Width & thickness of strip & bi-metallic strip : Positive Tolerance: (+) No Limit

Negative Tolerance: only upto (-) 2.5% but subject to meeting the requirement of specified/ approved cross- sectional area.

## **6.0 INSPECTION**

All the tests (as mentioned at Clause No.7.3) and Inspection shall be made at the place of manufacturer unless otherwise especially agreed upon by the tenderer and purchaser at the time of purchase. The tenderer shall offer required numbers of post insulators for Purchaser's inspection and after clearance of insulator, he will offer assembled Isolators for purchaser's inspection. The tenderer shall afford the

inspection officer(s) representing the purchaser all reasonable facilities without charges, to satisfy him that the material is being furnished in accordance with this specification. The purchaser has the right to have the tests carried out at his own cost by an independent agency whenever there is a dispute regarding the quality of supply.

The Inspection may be carried out by the purchaser at any stage of manufacture/ before despatch as per relevant standard.

Inspection and acceptance of any material under the specification by the purchaser, shall not relieve the tenderer of his obligation of furnishing material in accordance with the specification and shall not prevent subsequent rejection if the material is found to be sub-standard. The tenderer shall keep the purchaser informed in advance, about manufacturing programme so that arrangements can be made for inspection.

The purchaser reserves the right to insist for witnessing the acceptance/ routine testings of the bought out items.

## **7.0 TEST CHECKING OF MATERIAL AT STORES**

The material received in the stores of the NIGAM shall be subjected to the test checking at stores before final acceptance of the material, the procedure for the same shall be as under :

### **7.1 SAMPLING**

One sample out of each sub-lot / lot consisting of following quantities or part thereof from each inspected lot received in stores shall be selected for test checking of material and shall be got tested. The selection of sample from the material received at stores shall be done as soon as material is received in stores without the presence of the representative of the supplier. However, testing of sample(s) at CTL shall be carried out in the presence of representative of the supplier after identification / confirmation by him that sample so selected belongs to them.

**33 KV 800 Amp. Isolator with Post Insulator With out E.B. – 50 sets**

**11 KV 400 Amp. Isolator with Post Insulator With out E.B. – 100 sets**

### **7.2 TESTS**

The following tests shall be carried out on the above items :

- a) Visual examination , verification of dimensions, weight and marking as per PO/ GTP/ Approved drawing.
- b) Checking of current carrying parts as per approved drawings.
- c) Post Insulators :
  - i) Mechanical strength test.
  - ii) Porosity test
  - iii) Puncture Test
- d) All galvanized parts. - Uniformity of galvanization test.

Only those test(s) shall be conducted for which facility is available at CTL.

For witnessing of the testing, clear 7 (seven) days notice shall be given to the supplier by fax/ speed post stating date, time & place where the test is to be conducted. In case the supplier do not attend for witnessing the testing, the testing shall be proceeded and completed and action be taken as per the contract.

The Officer Incharge of Central Testing Lab (CTL) Jaipur shall send copies of test reports to the purchaser, consignees and the supplier.

### 7.3 CRITERIA FOR ACCEPTANCE

a) Visual examination , verification of dimensions, weight and marking. As per Specification/GTP/Approved drawing.

b) Checking of current carrying parts as per approved drawings.

If the dimensions of the current carrying metal part are in conformity with approved drawings, the material shall be accepted. When the dimensions of above parts are less than those minimum specified in the approved drawings but upto a limit of 5%, the material contained in the Lot ./ Sub-lot to which the sample belong shall be accepted subject to the conditions that the current density in above part is in conformity with contract and deductions at the rate of 2% cost of above parts for every 1% or part thereof reduction in weight due to less dimensions. The deduction shall be made for weight of above parts calculated on the basis of dimensions observed and found less. The weight shall be compared with one calculated on the basis of the minimum dimensions for the parts approved in the drawings. The rates for reduction shall be taken from the relevant IEEMA circular applicable on the date two month prior to the date of supply. When the dimensions are less than more than 5% as compared to the dimensions as per approved drawings, the material contain in the lot/ sub-lot to which the sample belongs shall be rejected and shall have to be replaced by the supplier.

c) Post Insulators : i) Mechanical strength test. ii) Porosity test  
iii) Puncture test.

In case of failure of any of samples in any of the above test , the material contained in the lot / sub lot received in the stores to which the sample(s) belong shall be rejected. The rejected material shall have to be replaced by the supplier free of cost.

d) All galvanized parts. - Uniformity of galvanization test.

i) The sample(s) shall be first tested for (n-2) number of dips where n is specified No. of dips in the contract. If the sample does not pass the uniformity of galvanization test for (n-2) dips, the material shall be rejected and the material relating to relevant sub-lot/ lot to which the sample(s) pertains shall have to be replaced by the supplier free of cost.

ii) If the sample has passed the uniformity of galvanization test for (n-2) dips, then it shall be tested for (n-1) dips. If the sample has not passed the uniformity of

galvanization test with (n-1) dips, the material pertaining to relevant lot/sub-lot shall be accepted with a deduction @ 4% of cost of galvanized material parts.

iii) If the sample passed the uniformity of galvanization test with (n-1) dips, then sample shall be tested for last one dip of one minute to complete the test for `n' dips. If the sample does not pass the uniformity of galvanization test with `n' dips, then the material pertaining to relevant lot/sub-lot shall be accepted with a deduction @ 2% of cost of galvanized material parts.

iv) If the sample(s) have passed the test with number of dips as specified in the contract (n), then material pertaining to relevant lot/sub-lot shall be accepted.

#### **7.4 TEST CHARGES :**

All test charges incurred towards test checking of the material received in our stores shall be borne by the NIGAM except that of personal expenses of the representative of the supplier for witnessing the tests.

**7.5 PAYMENT :** The payment shall be governed in accordance with the clause no. 1.42 of GCC with following modifications:-

#### **A. For the bidders who have furnished valid type test reports with the bid:-**

Payment shall be made only after receipt of successful test report from the CTL on the samples selected from the material received at the stores. However, the due dates for payment shall be considered from the date of submission of the bills along with receipted challans to Sr. Accounts Officer(CPC), JVVNL, Jaipur.

#### **B. For the bidders who have not furnished valid type test reports with the bid:-**

i) The 70% payment shall be released after receipt of successful test reports from CTL, Jaipur for the mandatory test checking on the samples selected from the material received at stores against first lot and subsequent lot(s) in anticipation of successful type test reports.

ii) The balance 30% payment shall be released after receipt of successful type test reports on the samples selected from the material received in the stores.

iii) The due dates for payment shall be considered from the date of submission of the bills along with receipted challans to Accounts Officer (CPC), JVVNL, Jaipur

#### **8.0 DRAWINGS:**

8.1 The tenders shall submit with his tender the bill of material and fully dimensional drawing of the offered isolators clearly showing the full details of material components and cross section of moving blade, male and female contacts, details of terminal arrangement, terminal pad, terminal connectors, operating mechanism showing the number and type of bearings, nominal diameter and thickness of various G.I. pipes, earth connectors etc. to be supplied by them to enable the purchaser to examine the offer.

The tenderer shall also furnish drawings and bill of material for supporting structures required for Isolators, although supporting structures are not in the scope of supply.

8.2 The successful bidder will submit the full dimensional on A-3 size paper in triplicate for our approval before commencement of supply. If the successful bidder manufacture the equipment without obtaining approval of drawing, the purchaser will not be responsible if any part is not as per required dimensions. Approval of drawings/work by Purchaser shall not relieve the Supplier of his responsibility and liability for ensuring correctness and correct interpretation of the latest revision of applicable standards, rules and codes of practices.

## 9.0 OPERATIONS AND MAINTENANCE INSTRUCTION MANUALS:

The successful tenderers shall have to supply three sets of operations and maintenance instruction manuals per set of isolator along with the erection manual and requisite detailed drawings of the equipments covered by this specification.

## 10.0 NAME AND RATING PLATE :

All items of the equipments included in this specifications shall be provided with a weather and corrosion proof plate **of name/trade mark of manufacturer, rating and TN in according with the provision of the IS:9921. The name & rating plate should be riveted on base channel. Further there should be proper marking on the base channel for identifying RYB phase.**

## 11.0 PACKING AND MARKING:

11.1 The equipment shall be packed in crates suitable for vertical/horizontal transport, as the case may be and suitable to withstand handling during transport and outdoor storage during transit. The Supplier shall be responsible for any damage to the equipment during transit due to improper and inadequate packing.

The easily damageable material shall be carefully packed and marked with the appropriate caution symbols. Wherever necessary, proper arrangement or lifting, such as lifting hooks etc., shall be provided. Any material found short inside the packing cases shall be supplied by Supplier without any extra cost.

11.2 Each consignment shall be accompanied by a detailed packing list containing the following information:

- a) Name of the consignee.
- b) Details of consignment.
- c) Destination.
- d) Total weight of consignment.
- e) Handling and unpacking instructions.
- f) Bill of material indicating contents of each package.

## 12.0 PRICES & PRICE VARIATION :

a) The prices shall be quoted in Rs. per set on F.O.R. destination basis in the manner detailed in schedule of Prices(Schedule-IV) indicating details of ex-works price, Excise Duty, Sales tax / VAT, freight & Insurance charges and Entry Tax, etc. for delivery at our stores.

b)The quoted price shall be variable as per Price Variation formula given in this specification at Schedule-II (A) & Schedule-II (B) without any ceiling. The base date of price variation shall be **1.3.2011** and shall be governed as per clause No.1.10. of Instructions to bidders. The offers in which prices have not been quoted in prescribed manner are liable to rejection.

c) If the price variation formula is changed, the same shall be applicable for the price variation. During the transit period when both old and new indices are being circulated,

then the admissible Price Variation shall be applicable, which is advantageous to Nigam, and the period from which the old indices are discontinued then the P.V. shall be admissible with the new indices.

### **13.0 GUARANTEED TECHNICAL PARTICULARS:**

Guaranteed technical particulars in Schedule-V shall be furnished along with the tender. Tenders not accompanied with Guaranteed technical particulars, type tests reports, detailed drawings and bill of material etc. are liable to be rejected.

### **14.0 COMPLETENESS OF EQUIPMENT:**

All fittings, accessories or material which may have not been specifically mentioned in this specification, but which are usual or necessary for the equipment shall be deemed to have been included in this specification. All equipments shall be complete in all respect.

### **15.0 LATENT DEFECTS, ERRORS & OMISSIONS:**

Any material/ equipments or part thereof that develops defects, errors or omissions in the apparatus, not disclosed prior to the final acceptance by the purchaser, but occur or are disclosed during the guarantee period, shall be corrected promptly. The equipment or part thereof shall be replaced by the supplier free of charges and all expenses for the transportation, handling, installation of such replacement or any other incidental charges shall be born by the supplier.

### **16.0 SPARES:**

List of spare parts recommended for five years of operation shall be furnished by the tenderer. The tenderer shall also quote unit F.O.R. Destination price of these spare parts stating elements of freight and insurance.

### **17.0 QUANTITY TOLERANCE :**

Quantity tolerance of plus minus 2% of ordered quantity shall be allowed in respect of each item for completion of supply.

### **18.0 DELIVERY SCHEDULE :**

The bidder is required to quote monthly delivery. The delivery of quoted quantity should be completed in **6 months** period including commencement period of **maximum 30 days in equal monthly rate for each type of insulators**. In case ordered quantity is different than quoted quantity, then monthly delivery shall be adjusted proportionately. Tenders in which monthly delivery is not indicated shall be ignored.

The tenderers are required to indicate the delivery schedule in the schedule attached with the Specification.