

**THE BRIHAN-MUMBAI ELECTRIC  
SUPPLY & TRANSPORT UNDERTAKING  
(OF THE MUNICIPAL CORPORATION OF  
GREATER MUMBAI)**



**SPECIFICATION NO.1030114**

**FOR**

**H.V. PROTECTIVE CURRENT  
TRANSFORMERS (CTs)**

**NOTICE FOR ADDITIONS / AMENDMENTS IN THE SPECIFICATIONS**

Attention of tenderers is invited to the following additions / amendments made in the specification.

<b>Sr.No.</b>	<b>Clause No.</b>	<b>Description of Clause</b>
1.	2.5 of Section 2	The current transformers shall be designed and manufactured out of the best materials <b>such as annealed copper, etc.</b> for satisfactory operation under fault conditions without causing any permanent injury or shortening of life.
2.	3.4.1 of Section 3	Drawing No. E/PL/103 B (4) Rev. 'C'

**THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING  
(OF THE BRIHANMUMBAI MAHANAGARPALIKA)**

**SPECIFICATION FOR H.V. PROTECTIVE CURRENT TRANSFORMERS (CTs)**

**SPECIFICATION NO.1030114**

**SECTION - 1 : GENERAL**

- 1.1 These high voltage protective current transformers are required for operating trip coils (with time limit fuses) of Oil Circuit Breakers (OCBs) / Vacuum Circuit Breakers (VCBs).
- 1.2 The primary distribution system voltage at present is at 11kV, 3-phase, 50 Hz. within the limits of Mumbai City.
- 1.3 The current transformers shall be designed to withstand a symmetrical short circuit level of 250 MVA (at 11kV) for 1.0 Seconds.
- 1.4 The protective current transformers shall be suitable for operation under the following climatological conditions in the city of Mumbai.
- a) Ambient temperature : Varying from 20<sup>o</sup> C to 40<sup>o</sup> C
  - b) Relative humidity : Varying from 62% to 85%
  - c) Rainfall in a year : Varying from 1808.8 mm to 3481.6 mm.

**Note :** The highest ambient temperature recorded in some of our indoor substations is 50<sup>o</sup> C.

## **SECTION - 2 : SPECIFICATION**

### **2.1 Requirement:**

The protective current transformers of various ratings are required under this specification. The requirement is as follows:

Item No.	Description	Quantity (in nos.)
1.	11kV, Protective Current Transformers as per the <b>Specification No.1030114</b> & Drawing No. E/PL-103B (4). <b>Rev.' C'dtd. 25/11/2014</b> Ratio : 60-35/5	
2.	--- do --- but Ratio : 100-60/5	
3.	--- do --- but Ratio : 300/5	

2.2 The current transformers shall be resin cast for use on each phase of 11kV, 3-phase, 50 Hz. effectively earthed system.

2.3 All current transformers shall be designed in accordance with IS:2705 (Part-I & III)/1992 for protective current transformers unless specified otherwise and also in accordance with the following supplementary specifications.

2.4 All current transformers shall be suitably tropicalised and rated for the service conditions on site.

2.5 The current transformers shall be designed and manufactured out of the best materials **such as annealed copper, etc.** for satisfactory operation under fault conditions without causing any permanent injury or shortening of life.

### **2.6 Transformation ratio and rated burden:**

The VA burden shall be minimum 15 VA at 5A for each ratio of dual ratio current transformer. Minimum knee point voltage shall be 35V for each ratio of dual ratio current transformer.

### **2.7 Accuracy Limit Factor:**

The accuracy limit factor as defined in Clause-3 of IS:2705, Part-III & shall be 10.

### **2.8 Accuracy Class:**

The current transformers shall have accuracy class 5P and will conform to clause 4.1 of IS: 2705 (Part-III) 1992.

## 2.9 **Temperature Rise:**

The current transformers shall be suitable for continuous operation at rated primary current at rated secondary burden. The temperature rise of the windings shall not exceed 60<sup>o</sup> C over an ambient temperature of 40<sup>o</sup> C and the temperature rise of the iron core if accessible (by thermometer) shall not exceed that permitted for adjacent windings.

## 2.10 **Variation in Voltage and / or Frequency:**

The current transformers shall be designed to give the rated output without loss of accuracy (with temperature rise not exceeding that specified in Clause No.2.8) at any voltage within +/- 12.5% of the rated voltage 11,000 Volts and with the frequency varying by 3% above or below the normal value of 50 Hz.

## 2.11 **Insulation:**

Insulation of winding shall be non-hygroscopic and shall not soften, lose shape or drain off under temperature stipulated in clause no. 2.9.

The core of the CTs and mounting clamps should be coated with epoxy / polyurethane compound.

## 2.12 **Terminal Markings:**

The primary and secondary terminals of the current transformers shall be clearly marked by distinctive letters as set out in IS: 2705 (Part-I)/1992. The secondary terminals shall be at P2 side. The distance between secondary terminals should be 45mm (Min.).

The marking shall be permanent and so placed to avoid ambiguity.

## 2.13 **Interchangeability & Mounting Arrangement:**

Current transformers are often required to be changed. Interchangeability of current transformers is therefore of extreme importance and close adherence to the dimensions given in the attached drawings E/PL-103B (4) is necessary, so far as fixing arrangements are concerned. The Creepage distance between busbar and the nearest earth point shall be min. 250 mm.

## 2.14 The tenderers shall furnish the cross section area of the primary winding.

## **SECTION - 3 : DESPATCH INSTRUCTIONS**

### **3.1 Tests:**

3.1.1 All tests specified in IS: 2705(Part-I) and clause-7 of IS:2705(Part-III)/1992 shall be carried out.

### **3.1.2 Type Test Certificates:**

The manufacturer shall furnish in duplicate type test certificates from NABL accredited laboratory such as CPRI, ERDA etc. for the type tests performed earlier on similar design as per relevant I.S. in line with the offered material. The manufacturers must furnish the magnetizing curve i.e. I (excitation) at  $V_k / 2$  and  $V_k$  volts for all CTs.

### **3.1.3 Additional Tests:**

In addition to the test specified above, the purchaser reserves the right of carrying out any inspection or reasonable tests at the manufacturer's works during all stages of manufacture of the current transformers as well as such tests as may be considered necessary after installation in the switchgear.

### **3.1.4 Acceptance Tests:**

The following tests will be carried out by us in our Testing Laboratory as per IS: 2705(Part-I & III)/1992.

- i) Verification of terminal marking of Polarity.
- ii) High voltage power frequency test on primary winding.
- iii) High voltage power frequency test on secondary winding.
- iv) Over voltage inter-turn test.
- v) Determination of error according to the requirements of appropriate accuracy class.
- vi) Magnetizing curve to determine accuracy limit factor.
- vii) Measurement of knee point voltage.

### 3.2 Name Plate Markings:

Each current transformer shall have the particulars indelibly marked on it or a label permanently secured on it, as per IS:2705(Part-I & III)/1992 respectively. In addition the, following description should be marked in bold letters at the top of the name plate. The name plate shall be screwed or riveted.

- i) Class of insulation
- ii) Year of manufacture

### 3.3 Packings:

The current transformers shall be despatched in suitable packing cases to withstand rough handling in transit. The contractor will be responsible for proper packing and protection to ensure safe transport from the manufacture's works to the BEST Undertaking, Kussara Stores Depot, Mazgaon, Mumbai – 400 010.

### 3.4 Drawings:

#### 3.4.1 Drawing No. E/PL/103 B (4) Rev. 'C' dated 25.11.2014.

3.4.2 Tenderer shall submit in duplicate the following drawings with the offer:

- a) Dimensional drawings.
- b) Diagram of connections.

3.4.3 The drawings shall be to scale and fully detailed. All important dimensions shall be given.

3.4.4 The successful tenderer will be required to supply triplicate copies of final drawings as specified above.

### 3.5 Guarantee:

The H.V. protection CT shall be guaranteed for 60 months from the date of commissioning or 66 months from the date of **supply**, whichever is earlier.

## ANNEXURE 'B'

**SECTION - 4 : SCHEDULE OF GUARANTEED PERFORMANCE & OTHER PARTICULARS (Must be filled in by the Tenderer)**

The particulars in this schedule will be binding upon the contractor and must not be departed from without the written permission of the General Manager.

Sr. No.	Description	Item		
		60-35/5	100-60/5	300/5
1.	Manufacturer's Name & Place of manufacturer			
2.	Brand Name			
3.	Offered C.T. Ratio			
4.	C.T. conforms to I.S. 2705 /1992(Part I & III )	Yes/No	Yes/No	Yes/No
5.	Rated voltage shall be 11kV +/-12.5% and frequency shall be 50 Hz +/- 3%. As per clause no 2.10 of specification	Yes/No	Yes/No	Yes/No
6.	<b>Insulation level</b> Highest System voltage – 12kV Power Frequency withstand voltage – 28kV Lightening impulse withstand voltage – 75kV as per Table 1A of IS 2705 Part I	Yes/No	Yes/No	Yes/No
7.	Rated short time current shall be 13.12 KA for 1.0 second as per clause no 1.3 of specification	Yes/No	Yes/No	Yes/No
8.	V.A. Burden at 5 Amps shall be min.15 VA and Accuracy class and limit factor shall be 5P and 10 respectively as per clause no 2.6 and 2.8 of specification respectively.	Yes/No	Yes/No	Yes/No
9.	Minimum knee point voltage shall be min.35 Volt as per clause no 2.6 of specification	Yes/No	Yes/No	Yes/No
10.	Temperature rise of winding above ambient temp. of 40° C at rated primary current at rated secondary burden shall be Max. 60° C as per clause no 2.9 of specification.	Yes/No	Yes/No	Yes/No
11.	Insulation of the CT shall be non-hygroscopic and core shall be coated with epoxy / polyurethane compound as per clause no 2.11 of specification	Yes/No	Yes/No	Yes/No
12.	The secondary terminals shall be at P2 side and the distance between secondary terminals shall be min. 45 mm as per clause no 2.12 of specification.	Yes/No	Yes/No	Yes/No
13.	Terminal marking shall be permanent as per cl. no. 2.12 of specification	Yes/No	Yes/No	Yes/No
14.	Whether fixing arrangement shall be as per Drg. No. E/PL – 103 B (4) Rev 'C'	Yes/No	Yes/No	Yes/No
15.	Min Creepage distance between busbar and the nearest earth point shall be Min. 250 mm as per cl. no. 2.13 of specification.	Yes/No	Yes/No	Yes/No
16.	Whether Dimensional drawings is submitted alongwith offer as per cl. No. 3.4.2 of spec.	Yes/No	Yes/No	Yes/No
17.	Permanent name plate shall be Screwed or riveted as per cl. no. 3.2 of specification.	Yes/No	Yes/No	Yes/No
18.	Whether list of orders executed enclosed	Yes/No	Yes/No	Yes/No

Date: \_\_\_\_\_

Signature of the Tenderer



**SECTION - 5 : SCHEDULE OF DEPARTURES FROM SPECIFICATION**

Tenderers shall mention in this schedule all departures from the various sections of the specification. In the absence of any mention in this schedule, the sections of this specification shall be binding on the tenderer.

Sr. No.	Reference to section No.of specification	Departures

Signature of the  
Tenderer : \_\_\_\_\_

Date : \_\_\_\_\_

## **SECTION - 6 : PRICES, DELIVERY & VALIDITY**

### **6.1 Prices:**

- 6.1.1 The prices shall be firm and for free delivery of the material to our Dharavi / Kussara / Anik Depot, Mumbai, including arrangement for unloading of material and keeping them at the proper place. The prices shall be inclusive of transit insurance. The prices shall however be exclusive of taxes and duties, which shall be clearly mentioned. The ex-work prices shall be mentioned for the purpose of charging excise duty.
- 6.1.2 The goods are meant for use in generation / distribution of electrical energy. Form 'E' / 'C' is applicable and the tenderers should indicate the exact sales tax that will be charged against issue of Form 'E' / 'C' by us.
- 6.1.3 It will be the responsibility of the manufacturer for safe transport of materials including arrangement for unloading and keeping the same at proper place. The freight charges, insurance and unloading charges shall be clearly quoted in the Schedule of Prices & Delivery. The offers of tenderers who quote only Ex-works prices will be overlooked.

### **6.2 Delivery:**

- 6.2.1 The successful tenderer shall submit drawings in triplicate within 2 weeks from the receipt of Acceptance Letter and get the same approved from Divisional Engineer, Planning (Materials), B.E.S. & T . Undertaking, 3<sup>rd</sup> Floor, Backbay Veej Bhavan, Gen. Jagannath Bhosale Marg, 149/150, Backbay Reclamation, Mumbai - 400 021, within 4 weeks from the date of submission of drawing. The firm has to depute technical representative for discussion, if any, during the drawing approval stages so as to avoid delay. Any delay in getting the drawing approved within the specified period will be treated as delay in delivery of the material and necessary L.D. charges will be charged as per clause no. 5 of Conditions of Supply.
- 6.2.2 The successful tenderer shall submit the 3 sets of approved drawings on A3 size paper and on 2 nos. of Compact Disc (CD) to Divisional Engineer, Planning (Materials).
- 6.2.3 The prototype unit shall be submitted as per approved drawing for inspection at Kussara Workshop within 8 weeks from the date of receipt of Acceptance Letter.
- 6.2.4 The balance quantity shall be delivered at Kussara within 6 weeks from the date of approval of prototype.
- 6.2.5 The delivery schedule given above is tentative and may be revised by us at our option. However, notice of 1 month would be given for the change in delivery schedule. Therefore, the tenderers shall specifically confirm that, they would agree to our deferred delivery schedule.

### **6.3 Validity :**

The offer should be valid upto \_\_\_\_\_. The offers with lesser validity period may be overlooked.

**ANNEXURE 'A'****THE BRIHAN-MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING****( Materials Management Department - Kussara)****PROFORMA FOR FURNISHING INFORMATION BY THE MANUFACTURING UNIT**

1.	Name of the Firm & Address of manufacturing Unit	
2.	Address for correspondence _____ _____ _____  Telephone No. : Office _____ Godown _____ Factory _____ Telephonic Address : _____ Telex No. : _____ Fax : _____	
3.	Constitution of the Firm Proprietary / Partnership /Private Ltd. /Public Limited.	
4.	Name & Office/Residential Address of Directors/ Partners/Proprietor	
5.	Directorship/Partnership in other firms.	
6.	Name of Bankers & their Full address & Tel. No.	
7.	Details of registration with SSI, NSIC / Central & State Govt. Authorities / Semi-Govt. Authorities / State Transport Undertakings /Reputed Public Ltd. & Pvt. Companies	Please attach xerox copies of the registration certificates.
8.	Details of registration with various tax / Govt. duties authorities such as : a) MST/CST Registration No. a) Excise Registration No.	Please attach xerox copies of the registration certificate _____ _____
9.	Details as regard collaboration, if any.	
10.	Area of the a) Factory Premises b) Godown/Store c) Office	_____ Sq.mtr./Sq.ft. _____ Sq.mtr./Sq.ft. _____ Sq.mtr./Sq.ft.
11.	The details of Machinery Equipment are installed in the factory.	Please furnish a separate list with all details indicating their sizes, capacity etc.

12.	a) Authorised capacity (Electric load) : b) Capacity Allowed (Electric load)	
13.	Persons on Roll a) Engineering/Science Graduates/Post Graduates b) Diploma holders b) ITI Qualified c) Skilled d) Semi-Skilled e) Unskilled f) Others.	
14.	No. of Shifts	
15.	Items manufactured	Separate list may be attached.
16.	Do you have any expansion/ diversion plans if yes, furnish details.	
17.	Please furnish a list source of raw materials/ sub-components and Quality assurance thereof.	Separate list may be attached indicating particulars of raw materials/components and source of purchase etc.
18.	Inspection of facilities/testing a) Equipments available b) Do you have your own laboratory for testing raw materials / finalised products.	List may be attached
19.	Any R & D facilities available? if yes, please furnish details.	
20.	Name of the reputed customers such as, O.E. manufacturers, Govt. / Semi Govt. / Organisation State Transport Undertaking / Reputed Public & Private Companies / Corporations.	List of orders executed alongwith xerox copies of the same during last 3 years with details viz. Name & address of organisation, material & quantity supplied & value of order must be attached.
21.	Whether the products have been tested at Central Institute of Road Transport, Pune / Central Power Research Institute, Bangalore/Electronic Research Development Association Baroda/OR at any Baroda/OR at any other recognised Institute/Laboratory.	Xerox copies of various recent test certificates be attached.
22.	In case of out-station firms, please furnish the name of the authorised distributors / agent available in Mumbai alongwith their address, telephone no. and their terms/conditions etc.	

23.	<p>Other information –</p> <p>a) Approx. Annual turnover (Last 2 financial years)</p> <p>b) Delivery facilities available</p> <p>c) Please furnish latest xerox copies of –</p> <p>    i) Rent Receipt / Monthly compensation receipt</p> <p>    ii) Electric Bill</p> <p>    iii) Telephone Bill</p> <p>i) Income Tax clearance certificate / Advance Tax paid receipt</p> <p>ii) Balance sheet / Annual report for last 2 financial years.</p>	<p>Certified copies of the same by Chartered Accountant must be attached.</p>
24.	<p>Any additional information not covered above.</p>	

Manager

Signature of the -  
Director / Partner / Proprietor /

(Seal of the Firm)