JAMAICA PUBLIC SERVICE COMPANY LIMITED

TECHNICAL SPECIFICATIONS

69 kV DRY TYPE POTENTIAL INSTRUMENT TRANSFORMER

JPS SPECIFICATION NO: 2013-0604-DTPIT

Prepared By

Engineering & Construction Department

Table of Contents

1 Scope

This specification covers potential instrument dry type transformers used in the measurement of voltage associated with the transmission of fifty (50) Hertz alternating current at nominal voltage of 69 kV.

2 General Requirements

2.1 *Information*

2.1.1 Refer to "Submittal of Information" Section 2 paragraph 2.1 of "Technical Specifications, General Requirements".

2.1.2 Supplier shall complete the data sheet "Appendix A" for submission with bid.

2.2 *Drawings Etc. By Supplier*

2.2.1 Refer to "Submittal of Information" Section 2, paragraph 2.2 of "technical Specifications, General Requirements.

3 Standards and Service Conditions

3.1 *Standards*

3.1.1 Refer to "Codes and Standards" Section 3 of "Technical Specifications General Requirements".

3.1.2 Design, construction, performance and tests shall conform to applicable sections of ANSI C57.13 – Requirements for Instrument Transformers and ANSI C12.11 – Standard for Instrument Transformers for revenue metering.

3.1.3 In the event of conflicts between this specification and any other specification to which it refers, this specification shall have precedence and shall govern. However, the bidder shall point out these conflicts in his bid at the time of tendering.

3.2 *Service Conditions*

The dry type substation instrument transformers to be supplied against this specification shall be suitable for satisfactory continuous operation under the following service conditions;

3.2.1 Refer to "Geographic Conditions" Section 4 of "Technical Specifications, Detailed Requirements".

3.2.2 The dry type instrument potential transformer will be installed between 24m and 1.6km from the sea. The instrument potential transformer may also be installed in close proximity to industrial plants emitting atmospheric pollutants in the form of acidic or alkaline dust and corrosive fumes. These plants may include those manufacturing Caustic Soda, Cement or processing Bauxite and Limestone.

4 Detailed Requirements

4.1 *Type*

4.1.1 Dry type, induction type, outdoor, one high voltage terminal, two secondary windings, potential transformers with covered secondary terminal box.

4.1.2 Potential transformer shall be primary 69,000 GRDY/ 40,250 V and is required for phase to ground connection on a 69,000 V Delta network with insulated or direct-grounded neutral points.

4.1.3 Secondary rated voltage: 115 V

4.2 *Ratings*

Particulars	Ratings
Rated Primary Voltage	69,000 GRDY / 40,250 V
Rated Secondary Voltage	115 V
Maximum System Voltage	72.5 kV
Basic Impulse Level	350 kV
Marked Ratio	350/600:1 & 350/600:1
Voltage Factor	1.9 for 8 hours
Accuracy Class	0.3 for burdens W and X
Frequency	50 Hz
Weight	≤ 250 kg
Minimum Creepage Distance	25 mm/kV

4.3 *Performance*

4.3.1 Temperature Rise

The temperature rise shall not exceed 55 degrees Celsius above maximum ambient temperature of 35 degrees Celsius.

4.3.2 Thermal Burden

Thermal Burden rating of the potential transformers shall not be less than 2,000 VA at thermal and current rating based on a temperature rise of 55 degree Celsius above ambient temperature of 30 degrees Celsius.

4.4 *Data to be furnished*

4.4.1 Bidder must attach to his proposal the "Date Form "included in the "Schedule of Technical Data" as Exhibit 'A' duly completed. Any deviations from this specification should be clearly identified by the bidder. All sections of the data form shall be completed and all information requested in this specification shall be submitted at the time of tendering.

4.4.2 Five (5) instruction manuals shall be provided with each unit. The instruction manual shall contain all the drawings and information necessary to allow complete installation of the unit.

4.5 *Construction*

The height and width of the unit shall not exceed 1500 mm x 500 mm respectively.

4.5.1 Coil

The potential transformer shall consist of a single coil encapsulated in epoxy resin in a single process under vacuum.

4.5.2 Primary Winding

The primary winding shall be manufactured from copper wire and shall be cast epoxy resin insulated. The neutral end of the primary winding shall be brought out in a terminal box.

4.5.3 Secondary Winding

Two (2) secondary windings shall be provided. The double ratio shall be achieved by means of secondary tap according to IEEE standards.

4.5.4 Hermetic seal

The instrument potential transformer as a unit shall be designed such that the interior is protected from air and moisture and the dielectric strength is preserved while allowing for thermal expansion. The expansion system shall not contain any moving parts and shall allow for pressure compensation, which will allow the unit to operate with negligible effect due to pressure changes within the unit.

4.5.5 Primary Terminals

The instrument potential transformer shall be equipped with a flat tin plated copper 4 hole NEMA pad. The terminal shall be capable of accommodating 100 mm sq to 470 mm sq (#4/0 AWG to 927.2 MCM) copper or aluminum conductors. The primary terminals shall also be able to withstand a static force of 5000N in any direction.

4.5.6 Secondary Terminals

The secondary terminals shall be clamp type and shall be able to accommodate wires of sizes ranging from 2.5 mm sq to 35 mm sq (#14 AWG through #2 AWG) copper or aluminum conductors.

4.5.7 Secondary Terminal Box

The terminal box shall be made from corrosion resistant cast aluminum. The cover of the terminal box shall be sealable. Provisions shall be made inside the terminal box for grounding of secondary terminals. Additionally, two (2) threaded 1" horizontal hubs with pipe plugs shall be provided for making connection to 1" conduit.

4.5.8 Grounding

The grounding terminal shall be situated the terminal box. The ground lug shall be designed to accept a one-hole ground connector. The terminal shall be suitable for connecting 100 mm sq to 200 mm sq (#4/0 to 394.5 MCM) copper conductors.

4.5.9 Baseplate

The baseplate shall be of a stainless steel material. The baseplate shall have dimensions not exceeding 650 mm x 650 mm and shall have four (4) holes which will aid in securing the instrument potential transformer to a sturdy base.

4.5.10 Polarity Marking

The relative instantaneous polarity of terminals or leads shall be clearly indicated by permanent markings that cannot be easily obliterated. The markings shall conform to ANSI C57.13 standards pertaining to markings.

4.5.11 Nameplate

Nameplate shall be fabricated from stainless steel. Markings shall be engraved in nameplate. The nameplates shall contain as a minimum the information referenced in ANSI C57.13 Section 7.5.

5 Tests

- Refer to "Tests" Section 5 of "Technical Specification, General requirements".
- Standard tests shall be performed according to ANSI C57.13 standards.
- Certified test reports shall be provided for all instrument transformers supplied.
- Test Certificates are required before approval is given to proceed with shipment.

6 Packaging and Marking

Refer to "Export Packaging" and "Export Marking" Section 7 and Section 8 of "Technical Specifications, General Requirements'.

Instrument potential transformer shall be supplied in weather proof shipping containers. All packaging shall be so construct as to ensure acceptance and safe delivery by common or other carrier to the delivery point called for in the purchasing documents. The packaging procedure used shall have received prior approval in writing from JPSCo.

On each shipping container, in weather proof lettering, the following minimum information shall be shown:

- JPSCo specification number
- JPSCo purchase order number
- Manufacturer's name or trademark
- Manufacturer's catalogue number
- Quantity
- Weights (Gross, Net and Unit)

7 Shipment

- No shipment of instrument potential transformers shall commence before the written authorization of the purchaser.

- JPSCo shall be informed at least ten (10) workings days prior to shipment.

8 Transportation

Units shall be transported in an upright position and shall be supplied ready for service

9 Warranty

- Warranty on equipment supplied shall be valid for thirty six (36) months from the time of receipt of equipment by the purchaser or twelve (12) months after installation, whichever is more.

- For defective equipment and material refer to "Technical Specifications – General Requirements Section 6".

APPENDIX A

SCHEDULE OF TECHNICAL DATA

DATA SHEET FOR INSTRUMENT POTENTIAL TRANSFORMER

Manufacturer	
Country of Origin	
Style or Catalog Number	
Primary Voltage	
Secondary voltage	
Basic Impulse Level	
Frequency	
ANSI Metering Accuracy	
Rating Factor	
Voltage Factor	
Creepage Distance	
Weight	
Width	
Length	
Height	
Drawing Number	

Index of Revision

Revision Number	Date of Revision	Revision made	Checked By
Prepared By: Leroy Fisher		**April 6, 2013**	
Prepared By: APRIL 12, 2013 **Leroy Fisher** **Engineer**		**Approved By:** APRIL 12/2013 **Osawaki Wickham** **Manager – Engineering & Construction**	