



SUPPLEMENTAL/BID BULLETIN (SBB) NO. 24-01

PROCUREMENT OF SUPPLY AND DELIVERY OF SUBSTATION TESTING EQUIPMENT

In accordance with Section 22.5.2 of the Revised Implementing Rules of RA 9184, this Supplemental Bid is hereby issued to clarify, modify or amend the following:

PARTICULAR(S)/QUERY(IES)	AMENDMENT(S)/CLARIFICATION(S)
<p><i>Section II. Instructions to Bidders</i></p> <p>15. Sealing and Marking of Bids</p> <p>Each Bidder shall submit one copy of the first and second components of its Bid.</p> <p style="text-align: center;">XXX</p>	<p><i>Section II. Instructions to Bidders</i></p> <p>15. Sealing and Marking of Bids</p> <p>Each Bidder shall submit one original (labeled as "Original") and two copies (labeled as "Copy 1" and "Copy 2") of the first and second components of its Bid.</p> <p style="text-align: center;">XXX</p>
<p>a. 3-Phase Digital Transformer Turns Ratio Tester</p>	<p>a. 3-Phase Digital Transformer Turns Ratio Tester</p>
<p>Description:</p> <p>The Three Phase Digital Transformer Turns Ratio (TTR) Tester is an important tool for determining the mechanical condition of transformers. All ratio tests are performed in one instrument, with only one 3Ø lead-set connection.</p> <p>The TTR has a color touch display, as well as an optional printer so results are never lost. This is complimented with the ability to download results to a USB memory device.</p> <p>The TTR has a color touch display and a built-in printer so results are never lost. This is complimented with the ability to download results to a USB memory device.</p>	<p>Description:</p> <p>The Three Phase Digital Transformer Turns Ratio (TTR) Tester shall be able to verify the mechanical condition of transformers. All ratio tests shall be performed in a single instrument with only one 3 Phase lead-set connection.</p> <p>The TTR shall have a color touch display, as well as printer so results can be printed. The results also can be downloaded to a USB memory device.</p>
<p>Testing Performed:</p>	<p>Testing Performed:</p>



<p>a. Ratio - 3Ø Step-up testing for power transformers</p> <p style="text-align: center;">xxx</p>	<p>a. Ratio - 3Ø Step-up/Step-down for power transformers</p> <p style="text-align: center;">xxx</p>
<p>Features:</p> <p>a. Step-up ratio testing</p> <p>b. Step-down ratio testing</p> <p>c. Confirmation of expected nameplate vector configuration</p> <p>d. Ability to measure actual vs expected phase shift</p> <p>e. Unique kelvin clamps with adjustable 3-inch jaw</p> <p>f. Banana plug input for connection to terminal blocks</p> <p>g. Turns ratio % error vs nameplate with pass/fail</p>	<p>REMOVED</p>
<p>Weight:</p> <p>6.5kg</p>	<p>Weight:</p> <p>6.0kg to 7.5kg (14lbs to 16.5lbs)</p>
<p>Dimensions:</p> <p>406 x 304 x 254mm (16 x 12 x 18in)</p>	<p>REMOVED</p>
<p>Ingress Protection:</p> <p>TTRU3: IP 51 TTRU3 in transit case: IP 67</p>	<p>Ingress Protection:</p> <p>Compliant with IP 51 In transit case: Compliant with IP 67</p>
<p>Environmental:</p> <p>Operating within -20°C to +50°C (-4°F to +122°F)</p> <p>Storage -30°C to +70°C (-22°F to +158°F)</p> <p style="text-align: center;">xxx</p>	<p>Environmental:</p> <p>Capable of Operating within -10°C to +50°C (-14°F to +122°F)</p> <p>Storage temperature -20°C to +70°C (-4°F to +158°F)</p> <p style="text-align: center;">xxx</p>
<p>Touchscreen:</p> <p>180mm (7 in.)</p> <p style="text-align: center;">xxx</p>	<p>Touchscreen:</p> <p>At least 180mm (7 in.)</p> <p style="text-align: center;">xxx</p>
<p>Case:</p> <p>Ruggedized case with fold out feet</p>	<p>Case:</p>

xxx	It shall include a hard case to protect the equipment during transportation. xxx
Internal/External Data Storage: Up to 2000 sets of 3 phase results internal storage xxx	Internal/External Data Storage: Capable up to 2000 sets of 3 phase results internal storage xxx
Communication/Control Software: 180mm (7in) built in display running custom GUI	Communication/Control Software: At least 180mm (7in) built in display running custom GUI
Printer Output: 51mm (2in) thermal printer xxx	Printer Output: At least 51mm (2in) thermal printer xxx
b. 3-Phase Power Quality Analyzer	
Description: The Power Quality Analyzer is an advanced handheld 3-phase analyzer that can view RMS data, waveforms, demand data, phase angles, harmonics, unbalance, flicker and more in real time. When data needs to be recorded, the record verification will automatically identify the current clamps, recognize their range and verify the unit is connected properly. It can record for extended periods. It can utilize an SD card, which makes expanding the memory as easy as installing a new SD card. The recorded data can be viewed on the VGA display or the data can be transferred to the Power Quality Analysis software via USB cable, USB stick, Ethernet or directly from the SD card.	Description: The Power Quality Analyzer shall be a handheld three-phase analyzer that can display RMS data, waveforms, demand data, phase angles, harmonics, imbalance, flicker, and other parameters in real time. When data needs to be collected, it shall automatically detect the present clamps, recognize their range, and ensure that the unit is attached correctly. It shall be capable to record for extended periods. It shall have a capability to utilize an SD card for recording data. The recorded data can be viewed on the VGA display or the data can be transferred to the Power Quality Analysis software via USB cable, USB stick, Ethernet or directly from the SD card.
Input Power: 120/240 V, 50/60 Hz	Input Power: Standard 120/240 V, 50/60 Hz
Battery: xxx Discharging time – up to 8 hours	Battery: xxx Capable of up to 8 hours of discharging time

Recharging time – 3 hours	At least 2 to 4 hours of charging time
Data Storage: External SD card (32GB max)	Data Storage: Can accommodate an External SD card (32GB max)
c. Transformer Ohmmeter	
Description: The Transformer Ohmmeter is a line-operated, field-portable instrument designed specifically to measure the dc resistance of all types of magnetic windings safely and accurately. It can test transformers and rotating machine windings and perform low-current resistance measurements on connections, contacts, and control circuits.	Description: The Transformer Ohmmeter shall operate reliably and safely measure the DC resistance of any kind of magnetic winding. It shall be capable of testing transformers and rotating machine windings, as well as measuring low-current resistance in connections, contacts, and control circuits.
Input: 120/240 V, 50/60 Hz, 720 VA	Input: Standard 120/240 V, 50/60 Hz, 720 VA
Displays: Two 1” high, 6 character, 7-segment, LCDs One 0.71” high, 6 character, 7-segment, LCDs	Displays: At least Two 1” high, 6 character, 7-segment, LCDs At least One 0.71” high, 6 character, 7-segment, LCDs
Environmental: Operating: 14° F to 122° F (-10° C to 50° C) Storage: 5° F to 158° F (-15° C to +70° C) xxx	Environmental: Operating: 23° F to 122° F (-5° C to 50° C) Storage: 14° F to 158° F (-10° C to +70° C) xxx
Dimensions: 8.5 H x 21.5 W x 13 D in (216 H x 546 W x 330 D mm)	REMOVED
Weight: Net 29 lb (13.1 kg)	Weight: Net Weight: 25lbs – 30lbs (11kg to 14kg)
Accessories: V1 Potential Lead, 60ft (18m) V2 Potential Lead, 60ft (18m)	Accessories: V1 Potential Lead, at least 60ft (at least 18m) V2 Potential Lead, at least 60ft (at least 18m)

Current Lead Set, 60ft (18m)	Current Lead Set, at least 60ft (at least 18m)
Jumper Lead, 30ft (9m)	Jumper Lead, at least 30ft (at least 9m)
Ground Lead, 15ft (4.5m)	Ground Lead, at least 15ft (at least 4.5m)

Issued this 8th day of July 2024 for guidance and information of all concerned.



Atty. ALEXANDER PAUL T. RIVERA
Chairperson, Bids and Awards Committee

Technical Specifications

Item	Specification	Statement of Compliance
a. 3-Phase Digital Transformer Turns Ratio Tester		
Description	<p>The Three Phase Digital Transformer Turns Ratio (TTR) Tester shall be able to verify the mechanical condition of transformers. All ratio tests shall be performed in a single instrument with only one 3 Phase lead-set connection.</p> <p>The TTR shall have a color touch display, as well as printer so results can be printed. The results also can be downloaded to a USB memory device.</p>	
Testing Performed	<p>a. Ratio - 3Ø Step-up/Step-down for power transformers</p> <p>b. Phase shift and phase deviation</p> <p>c. Polarity</p> <p>d. Magnetic balance/flux distribution</p> <p>e. Excitation current characteristics</p> <p>f. Auto vector detection/recognition</p>	
Input Power	90-264VAC, 47-63Hz, 250VA Max	
Output Power	<p>Voltage: 3Ø, 1 - 48VAC, up to 125V on Primary</p> <p>Frequency: 50-480Hz</p> <p>Current: 0.1mA - 1A, Max 2A @ 48V</p>	
Turns Ratio Measurement Methods	<p>1Ø Step Up</p> <p>1Ø Step Down</p>	
Turns Ratio Range and Accuracy – Guaranteed accuracy from -20°C to +50°C	<p>Step Down Excitation</p> <p>25-48V</p> <p>±0.10% 0.8 - 1000</p> <p>±0.20% 1001 - 2000</p> <p>±0.60% 2001 - 15000</p> <p>±1% 15001 – 50000</p>	

	<p>1-24V $\pm 0.10\%$ 0.8 - 1000 $\pm 0.20\%$ 1001 - 2000 $\pm 0.60\%$ 2001 - 15000</p> <p>Step Up Measurement 25-125V $\pm 0.10\%$ 0.8 - 200 (most Power Tx) 1-24V $\pm 0.10\%$ 0.8 - 200</p> <p>At least 5 digit resolution</p>	
Excitation Current Measurement	<p>Resolution: 0.1mA 0.1mA - 100mA 1mA 101-2000mA Accuracy: $\pm 1\% \pm 0.1$ mA</p>	
Frequency Measurement	<p>Resolution: 0.1 Hz Accuracy: $\pm 0.1\% \pm 0.1$ Hz</p>	
Transformer Phase Measurement	<p>Range: 0 - 360 Degrees Accuracy: ± 0.05 Degrees</p>	
Weight	6.0 to 7.5 kg (14lbs to 16.5lbs)	
Environmental	<p>Capable of Operating within -10°C to $+50^{\circ}\text{C}$ (-14°F to $+122^{\circ}\text{F}$) Storage temperature -20°C to $+70^{\circ}\text{C}$ (-4°F to $+158^{\circ}\text{F}$) Relative Humidity 0-90%, non-condensing</p>	
Ingress Protection	<p>Compliant with IP 51 in transit case: Compliant with IP 67</p>	
Regulatory	<p>Safety IEC 61010-1:2010 + AMD1:2016 EMI/EMC IEC 61326-1:2012 RoHS2 EN50581 Vibration/Drop/Shock MIL-STD-810G</p>	
Touchscreen	<p>At least 180mm (7 in.) 800 x 480 Resolution 1100 NITS</p>	
Transformer Testing Standards	<p>IEEE C57.152-2013 IEC 60076-1:2011 AS/NZS 6076 1:2014 CIGRE 445 2011</p>	
Case	<p>It shall include a hard case to protect the equipment during transportation. Canvas carrying bag for leads and accessories</p>	
Internal/External Data Storage	Capable of up to 2000 sets of 3 phase results internal storage	

	Transferable via USB 2.0/3.0 thumb drive (32 GB)	
Communication/Control Software	At least 180mm (7in) built in display running custom GUI	
Printer Output	At least 51mm (2in) thermal printer Prints all measurement data displayed on GUI	
Accessories	AC Adapters & Power cord – at least 2 meters 3 Phase Universal Shielded Test Lead Sets USB Cable at least 2m (at least 6ft) OLTC Tap Changer Cable – at least 9m (at least 30ft) Cable bag – backpack Thumb drive (32 GB) Triple function pen Calibration Certificate	
b. 3-Phase Power Quality Analyzer		
Description	The Power Quality Analyzer shall be a handheld three-phase analyzer that can display RMS data, waveforms, demand data, phase angles, harmonics, imbalance, flicker, and other parameters in real time. When data needs to be collected, it shall automatically detect the present clamps, recognize their range, and ensure that the unit is attached correctly. It shall be capable to record for extended periods. It shall have a capability to utilize an SD card for recording data. The recorded data can be viewed on the VGA display or the data can be transferred to the Power Quality Analysis software via USB cable, USB stick, Ethernet or directly from the SD card.	
Measured Parameters	a. RMS Voltage / Current b. Total Harmonic Distortion c. DC Voltage d. Total Demand Distortion	

	<p>e. DC Current (requires dc CT)</p> <p>f. Harmonics</p> <p>g. Phase-to-Phase Voltage</p> <p>h. Inter-harmonics</p> <p>i. Power Parameters</p> <p>j. (KW, KVAR, KVA, DPF, TPF)</p> <p>k. Energy parameters</p> <p>l. (KWH, KVARH, KVAH)</p> <p>m. Voltage sag/dips and swells</p> <p>n. Mains signaling</p> <p>o. Phase angles</p> <p>p. Harmonic direction</p> <p>q. Current sags/dips and swells</p> <p>r. IEC flicker</p> <p>s. Transient down to 1 msec</p> <p>t. Rapid voltage change</p> <p>u. IEC unbalance</p> <p>v. Phase angle deviation</p> <p>w. Frequency</p> <p>x. ANSI unbalance</p> <p>y. Event waveform capture</p> <p>z. Timed waveform capture</p>	
Input Power	<p>Standard 120/240V, 50/60 Hz</p> <p>International power adapter supports US, UK, EU and Australian Plugs</p>	
Battery	<p>NiMH battery pack (field replaceable)</p> <p>Capable of up to 8 hours of discharging time</p> <p>At least 2 to 4 hours of charging time</p>	
Data storage	<p>Can accommodate an External SD card (32GB max)</p>	
Communication	<p>USB communications</p> <p>Ethernet communications: network communications.</p> <p>Wireless communications with off-the-shelf bridge.</p> <p>USB stick (32GB) - transfer data file to USB. Transfer setup configurations to and from USB stick.</p> <p>Perform firmware upgrades using USB stick.</p> <p>SD card (32 GB): automatically writes data to SD card; no manual transfer required. Transfer setup configurations to and from SD card. No tool needed to access the SD card.</p>	
Accessories	<p>Set of 5 voltage leads with alligator clips</p> <p>Set of 3 fused adapters</p>	

	Strap for hanging the Analyzer Unfused voltage lead kit 32 GB SD card USB Communications cable USB Memory stick contains user guide, PQ PC Software and PQ PC Software user guide Ethernet communications cable Soft sided case Power cord Universal 24Vdc power adapter Battery pack Calibration Certificate	
c. Transformer Ohmmeter		
Description	The Transformer Ohmmeter shall operate reliably and safely measure the DC resistance of any kind of magnetic winding. It shall capable of testing transformers and rotating machine windings, as well as measuring low-current resistance in connections, contacts, and control circuits.	
Input	Standard 120V/240 V, 50/60 Hz, 720 VA	
Output	User Selectable Current Ranges: up to 10 mA up to 100 mA up to 1 A up to 10 A Open-Circuit Test Voltage: up to 50 V dc	
Resistance Measurement/Display	Resistance: 1 mW to 2000 W Accuracy: $\pm 0.25\%$ reading, $\pm 0.25\%$ full scale (when current has stabilized) Resolution: Up to 6 digits	
Displays	At least Two 1" high, 6 characters, 7- segment, LCDs At least One 0.71" high, 6 characters, 7- segment, LCDs	
Printer	Via RS-232 port	
User Interface	B&W alphanumeric displays, keypad	
Computer Interface (for downloading results)	Via RS-232 port Internal Data Storage can store data up to 10,000 data sets	
Environmental	Operating: 23° F to 122° F (-5° C to 50° C) Storage: 14° F to 158° F (-10° C to +70° C)	

	Relative Humidity: 0-90% non-condensing	
Weight	Net Weight: 25lbs – 30lbs (11kg to 14kg)	
Accessories	V1 Potential Lead, at least 60ft (at least 18m) V2 Potential Lead, at least 60ft (at least 18m) Current Lead Set, at least 60ft (at least 18m) Jumper Lead, at least 30ft (at least 9m) Ground Lead, at least 15ft (at least 4.5m) RS232 Cable for connecting to a PC and Printer Remote Hand Switch AC Power Cord Quick Start Guide Canvas carrying bag for leadset Ethernet Cable Instruction Manual Computer Software for Transformer Ohmeter Calibration Certificate	
<i>-NOTHING FOLLOWS-</i>		