Annexure - A

Technical Specification of Three Phase Meter Test Bench (Supplementary as amendment)

1.0 APPLICABLE STANDARDS

The equipment and the components supplied with the equipment shall be in accordance with the latest editions and or amendments of the standards specified below following the relevant IEC Standards. However, the specific requirements mentioned below shall also prevail.

1. General

The three phase energy meter test bench shall be of latest and new generation, high precision energy meter calibration equipment using advanced technology and electronic components. The test bench shall have the facility to be operated from embedded keyboard and or PC software. It shall be equipped with electronic phantom load power source, assuring high stability, security and large output capacity with automatic adjustment of current measurement range; and with the fault self-detection in voltage amplifier and current amplifier. The equipment shall have the facilities to work with RS-232 interface, and can be operated from software. The test results can be saved to database, can be inquired from database, and can be printed out.

The parts of the test bench shall include but not limited to the followings:

1. Error calculator.
2. Bracket for tested meters.
3. RS485 Communication Port.
4. Pulse input.
5. Power switch.
6. Output display
7. Signal generator.
8. On line/off line switch.
9. Three phase reference meter.
10. Voltage terminal for tested meter.
11. Current shortcut.
12. Phantom load power source.

Phantom Load Power Source:

Power and consumption:

Power supply: 3 Phase, 4 Wire 3 x 230 Volts ±10%
Max consumption: 4000 VA (24 meter positions)

Current source:

Output current: 3×0.001 Amps - 3×120 Amps
Adjusting resolution: 0.01% (min. 0.0001A)
Power factor: $0\sim360^{0}$; resolution: 0.1^{0}
Output frequency: 45Hz~65Hz;
THD (sine wave output): <0.8%
Stability of current during sine wave output: 0.05% (180s)
Output wave: Sine wave 2-21 harmonic wave, total should be less than 40%
Output capacity: 20VA per meter position

Voltage source:

Output voltage: 3×30 Volts - 3×480 Volts
Load: Could be resistive / inductive / capacitive (<4uF)
Adjusting resolution: 0.01% (min. 0.1V)
Output frequency: 45Hz~65Hz;
Voltage stability of power source during sine wave output: 0.05% (180s)
Output wave: sine wave 2-21 harmonic wave, total should be less than 40%
Output capacity: 15VA per meter position

Reference Meter:

Power and consumption:

Power supply: 1 Phase, 2 Wire 230V ± 10%, 50Hz;
Max consumption: 30VA
Voltage input: 3×30V-3×300V (AC)
Current input: 3×0.001A-3×100A (AC)
Accuracy:
Active power: 0.05% (PF>0.5)
Reactive power: 0.1% (PF>0.5)
Warm up time: < 2 minutes

Max. frequency of impulse could be: 200Hz
Error display range: 0.001% - 99.99%
Password: The operational functions of the test bench shall have protection password to avoid unauthorized use.

System Parameter: System Parameter includes meter position/display selection and other system parameter.
Output Parameter: Output Parameter includes voltage output parameter and current output parameter.
Screen Display: All features shall be displayed in English, LCD.
Auto adjusts: Shall have the feature to rectify the output value automatically if the real output value or real output angle is different with the set value.

Annexure - A

Sl. No.	Item Description	Requirement
01.	Accuracy class:	0.1
02.	Standard Energy Meter Accuracy class:	0.05
03.	Range of Phase: Fine adjustment (minimum):	0-360° 0.1°
04.	Frequency: Fine adjustment (minimum):	45 Hz – 65 Hz 0.1 Hz
05.	Waveform distortion coefficient voltage/current:	< 0.5 %
06.	Stability of Output Power (voltage, current, power factor):	<0.05 %
07.	Load: Capacitance, Resistance, Inductance	≤ 4 µF
08.	Starting Current Output (minimum): Accuracy:	1 mA 5 %
09.	Starting Power: Accuracy:	 10 %
10.	Numbers of calibrated Energy Meters:	24
11.	Test Result logging facility	Computerized