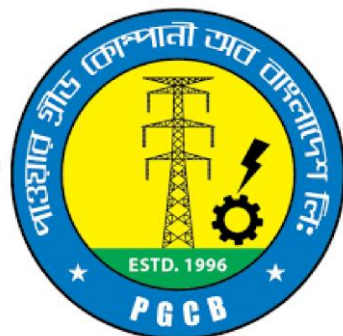


POWER GRID COMPANY OF BANGLADESH LIMITED (PGCB)



**Single-Stage Two Envelope
Bidding Procedure**

**BIDDING DOCUMENT
FOR
THE PROCUREMENT OF**

Supply of Different Types tools and safety equipment for PGCB Maintenance upgradation

**Contract No.: PGCB/WB/ESPNERP/Safety-
tools/Lot-2**

Volume 2 OF 2

Project: Enhancement & Strengthening of Power Transmission Network in
Eastern Region

Invitation for Bids No.: 27.21.0000.101.07.423.24.1493

IDA Credit No: 6177-BD

Employer: Power Grid Company of Bangladesh Limited

Country: People's Republic of Bangladesh



Technical Specifications and Technical Requirements

“All the pictures of the equipment are for visual understanding and tender purpose only. Actual product may be appeared different than the pictures given in the tender.”



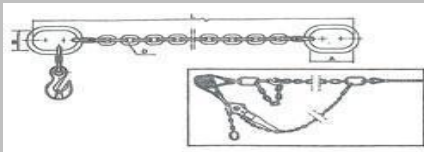
Sl. No	Description	Equipment	Remarks	No of Quantity
1.	High Vacuum Transformer Oil Purifier		Transformer oil treatment plant for removing gases and moisture from insulating oil.	2
2.	Vacuum Pump System for Transformers		Transformer Vacuum pump for oil filling under vacuum and for drying	8
3.	Vacuum/Pressure Gauge for Transformer Drying		To check the vacuum and pressure of transformer during drying and oil filling processes.	7
4.	WTI/OTI Calibrator		To check the function of transformer temperature gauges and to perform calibration.	7
5.	Portable Partial Discharge (PD) Diagnostic System for High Voltage Equipment.		To detect the PD activities due to failure of part of insulation system to withstand the electrical field applied to it. This can be a result of poor design, poor workmanship, defective materials, contamination, or aging.	7
6.	Sweep Frequency Response Analyzer (SFRA)		To detect power transformer problems such as Shorted turns or open windings, Winding displacement or deformations, Core movements, Winding	3

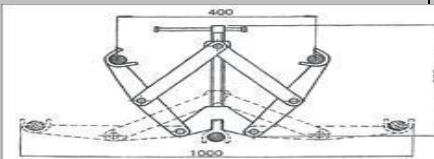
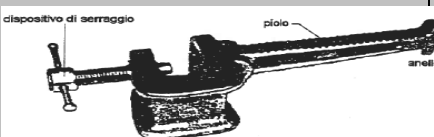
Sl. No	Description	Equipment	Remarks	No of Quant ity
			connection problems, and Broken clamping structures.	
7.	Current and Voltage Transformer Test Equipment		CT grouped testing includes Demagnetization, Knee Points, Ratios, Saturation Curves, Winding Resistances, Polarities and Phase Deviation (on all taps of multi-ratio CTs). VT testing including Demagnetization, Ratio, Winding Resistance, Polarity and Phase Deviation, Performs Secondary Burden tests, and Integrated 1 kV DC insulation test system	8
8.	Harmonic & Power Quality Analyzer		To check Harmonic and power quality of power system.	2
9.	TRANSFORMER TURNS RATIO TEST SETS		Three Phase Transformer Turns Ratio Meter	7
10.	Circuit Breaker and Coil Analyzer Test Set		The measurement of time, opening and closing coil current consumption, and performing static and dynamic contact resistance measurement. Also measuring displacement of	8

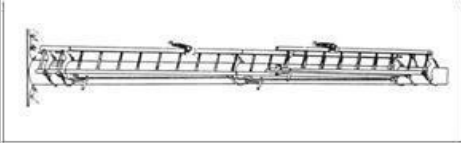
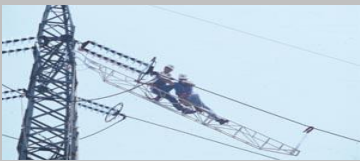
Sl. No	Description	Equipment	Remarks	No of Quantity
			the circuit breaker moving parts, contact wipe, over-travel, rebound, damping time and average velocity	
11.	Handheld Dynamic Micro Ohm Meter		Dynamic Resistance Measurement, Dual ground operation, Automatic de-magnetization function.	50
12.	AC/DC Power Supply for Testing Circuit Breakers		DC and AC power supply unit for circuit breakers Coils and Spring-Charging Motors testing.	8
13.	Sf6 Gas Analyzer Test Set		To test SF6 quality, volume percentage (%) Moisture concentration, SO2 concentration (ppm), HF concentration (ppm), H2S concentration (ppm), and CO concentration (ppm)	10
14.	High Performance Daylight Corona Imaging Camera		The HD sensor allows the CoroCAM® 6HD to record details - this means the user can see the smallest features of the fault location	2
15.	Multi-Range Voltage Indicator / Transmission line voltages (600V through 765 kV) tester		The transmission Multi-Range Voltage Indicator is a portable tool used to confirm whether an AC (Alternating Current) transmission high voltage power circuit is energized or de-energized prior to performing maintenance.	2

Sl. No	Description	Equipment	Remarks	No of Quant ity
			The instrument has been specifically designed to work with transmission voltages (600V through 765 kV). It also provides the user the ability to observe lower voltages that may be present due to induction or storm. emergency situations.	
16.	Laser Rangefinder		Calculates Horizontal Distance (HD) + Vertical Distance (VD) + Height (HT) + 2D Missing Line (ML)	12
17.	Safety ground for Transmission Line and Substation Equipment		Personnel safety ground for transmission line and substation equipment	25
18.	Clamp on Ground Resistance Tester for Towers and Poles.		These instrument help to automatically determine the ground loop resistance at a grounding connection.	26
19.	Temporary Ground Rod at Transmission Line Site		To provide temporary ground at work site where a system ground is not available.	2

Sl. No.	Description	Equipment		Remarks	No of Quantity
20.	Hydraulic Puller-Tensioner (Stretching Winch)			This equipment are used for the stringing of the conductors and the guard rope	2
21.	Service Winch			This Service Winch is used to lift loads and to build pylons	2
22.	Coil			This tool is used to wind and recover the ropes during the stringing of the conductors	1
23.	Conductor Car for Single Conductor Inspection			The trolley is used to run through the spans of power lines and for inspection of single conductors	4
24.	Conductor Car for Multiple Conductor Inspection			Trolley for inspection on double and triple conductors	4
25.	Pulley for Multiple Conductor			This tool is used for stringing multiple conductors. Some of these tools have earth incorporated	35
26.	Pulley for Single Conductor			Pulley for stringing single conductors	35

Sl. No	Description	Equipment	Remarks	No of Quant ity
27.	Pulley for Grounding WIRE		A specific pulley is required to string the ground rope, in particular for ropes with incorporated optical fiber the diameter must be very large > 1000 mm	35
28.	Mooring Chain		During the stringing phases, the conductors must be attached to the pylons or to the ground. These chains are used to ensure a secure bond.	12
29.	Hydraulic Reel Stand		This tool raises the reel of the traction ropes to allow the reel to rotate during the stringing phases	10
30.	Electrical Shear		This tool allows you to cut conductors and cables quickly and precisely	12
31.	Grounding Kit		This earthing and short circuit device is suitable for medium voltages	200

Sl. No	Description	Equipment	Remarks	No of Quant ity
32.	Retractor for Trinate Conductor		This tool allows you to bring the conductors from the "flat" position maintained during the stringing, to the final triangular position, to install the spacers	4
33.	Headlights		If work is to be carried out at night, lighting systems are required	10
34.	Machine for Fiber Optic		Equipment for the execution of optical fiber joints	2
35.	Pressure Washer		The equipment is used to wash insulators in areas with heavy pollution	8
36.	Heavy Duty Grip Hoist (Wire Rope Puller)		This hoist is used to retrieve the handlers and make shooting postponements from the ground	25
37.	Handling rung		This tool is used when climbing the lattice pylons, to create support points for the operator's feet	25

Sl. No	Description	Equipment	Remarks	No of Quant ity
38.	Ladder for Tubes Pole		This type of ladder allows you to climb the tubular supports by several pieces on top of each other.	2
39.	Heavy-Duty Extendable Insulating Fiber Glass Ladder		Fiberglass power transmission pole for emergency restoration	200
40.	Suspension Ladder for Work on Lattice Towers		The suspension ladder is used to reach the clamp of the suspension chains and to be able to operate under the shelves	25
41.	Mooring Ladder for Work on Lattice Towers		The ladder is anchored between the pylon shelf and the conductor. In this way the operator can reach any point of the block chain, or install a mooring on the conductor for taking charge	15

Sl. No	Description	Equipment	Remarks	No of Quant ity
42.	Tackle Blocks		These hoists are used to lift weights and loads. There are models with steel ropes and models with synthetic fiber ropes	25
43.	Hydraulic Hand Operated ACSR Conductor Cutter		Useful tool for cutting conductors and cables. Compared to the electric one, it has a higher cutting capacity	25
44.	Crossbar for Mooring (Working Platform)		This working bridge is used to work on amar chains, especially when making connections.	15
45.	Manual Lever Chain Hoist (6 Ton)		This chain hoist is used in many jobs for taking charge of conductors and earth ropes. It is normally combined with metal or fiber strips and self-	40

Sl. No	Description	Equipment	Remarks	No of Quant ity
46.	Battery Load Test Set		tightening clamps The battery load test is performed to determine the health and the actual capacity of a battery pack with increasing age.	9
47.	Digital Clamp Meter Test Set		Clamp meters are used during the installation, maintenance, and inspection of electrical systems and equipment.	28
48.	Tower Harness with Absorbing Lanyards		A safety lanyard is used to securely attach the worker's harness to an immovable object that can support a person's weight should they lose their balance, during OHL tower inspection and maintenance tasks.	100
49.	Quad Box Ratcheting Wrench		The QuadBox ratcheting wrenches give 4 sizes on 1 wrench. Used in OHLs maintenance tasks to limit number of wrenches used.	10
50.	Insulation Oil Moisture Analyzer Test Set		Used to measure the moisture content of the transformer dielectric oil.	2

Sl. No	Description	Equipment	Remarks	No of Quantity
51.	Oil Interfacial Tension Test Set		Used to monitor the degradation of insulating oil measuring the interfacial tension (IFT) index for evaluating deterioration with increasing age.	2
52.	Oil Acidity Test Set		Used to monitor the degradation of insulating oil measuring the acidity index for evaluating deterioration with increasing age	2
53.	Insulating Oil Dielectric Breakdown Test Set		Used to determine the Breakdown Voltage (BDV) of Dielectric Oil present in transformer, OLTCs, Breakers, etc. A low value of BDV indicates presence of moisture content and conducting substances in the oil.	2
54.	Insulating Oil Tan Delta Test Set		Dielectric and insulation testing on all types of electrical apparatus	2
55.	DGA test kit (Gas Chromatography)		Test is done by Gas Chromatography	2

Sl. No	Description	Equipment	Remarks	No of Quantity
56.	Online DGA Test Kit		Optical measurement, Photo-acoustic spectroscopy (PAS), Fourier Transform Infra-Red (FTIR)	1
57.	Three Phase Automated Transformer Test Set		Three Phase Transformer Turns Ratio Meter	26
58.	EARTH GROUND TEST SET / Tower Footing Resistance Meter		Tool for a grounding resistance measurement in each tower of a in-service transmission line.	2
59.	Vacuum Interrupter Test Set		Field service test for vacuum interrupters predicting the usable life of the vacuum interrupter.	2

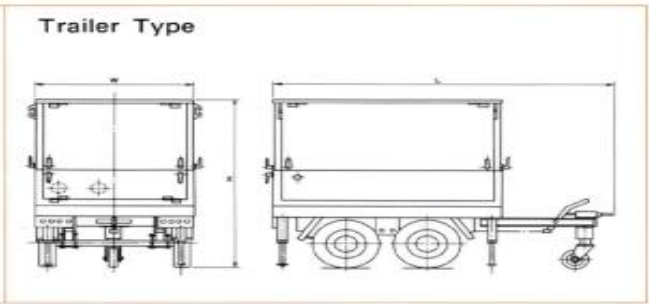
Sl. No	Description	Equipment	Remarks	No of Quant ity
60.	Digital Multimeter Test Set		Supplying of brand new, light weight, rugged & robust Digital Multimeter having high accuracy and high quality without disturbance in high electromagnetic field.	27
61.	Multi-Functional Primary Test System for Substation Commissioning and Maintenance		Multi-functional test device for on-site substation asset commissioning and maintenance. It replaces several individual testing devices.	6
62.	Voltage Transformer Testing, Calibration and Assessment		Used for on-site testing, calibration, and assessment of inductive and capacitive voltage transformers.	11

Guaranteed Technical Particulars



1. Guaranteed Technical Particulars for High Vacuum Transformer Oil Purifier

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. No.	Name of Item	Required specifications	Bidder's Guaranteed Particulars
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan	
5	Power Supply	3 Phase 4 wire 440V $\pm$ 10 % 50Hz $\pm$ 10%	
6	Capacities	Oil Flow rate 1000 to 1200 L/H (Litter per hours), Vacuum Pump L/m 3,500 or more, Mechanical Booster m3/h 1250/1500 or more.	
7	Mounting	Trailer mounted, 2 Axils, 4 Wheels, 4 adjustable jacks to elevate the trailer, 5th small balancing small wheel, lift able sides cover, weather proof, standard Width, Height and length for local roads, towing hitch, towable with pickup truck at 60 kilo meter per hours. Suspension system, Back signal and brake lights. Mechanical parking breaks.  	
8	Guaranteed Performance	After 1 pass Water ppm tested by ASTDM D1533 up to 2 or less Gases (volume %) tested by ASTDM D2945 up to 0.05 or less Dielectric Strength [kV] tested by IEC156 up to 80kv or more After 3 pass Water ppm tested by ASTDM D1533 up to 1 or less Gases (volume %) tested by ASTDM D2945 up to 0.01	

Sl. N o.	Name of Item	Required specifications	Bidder's Guaranteed Particulars
		or less Dielectric Strength [kV] tested by IEC156 up to 90kV or more IEEE C57.106 meet or exceed the acceptance limits IEC 60422 meet or exceed the acceptance limits IEC 60296 meet or exceed the acceptance limits	
9	Alarms	High pressure alarm, High oil level in the vacuum chamber alarm, High oil level in the vapor trap, High foam level in the vacuum chamber alarm.	
10	Flow Schematic	FLOW SCHEMATIC	

Sl. N o.	Name of Item	Required specifications	Bidder's Guaranteed Particulars
11	Connection	Inlet and outlet with 2 inches quick connection. Vacuum connection with 2 inches flange.  	
12	Inlet, outlet, and bypass, vacuum valves	2" STAINLESS STEEL Ball Valve with Handle and CHROMIUM ABS Ball, Manual operation in addition to automatic control.	
13	Inlet Strainer	Replaceable 60 mesh screen	
14	Oil inlet pump	12,000 L/H capacity. Metal screened safety cover	
15	Oil outlet pump	12,000 L/H capacity delivery pressure at 50 PSI or more, Metal screened safety cover	
16	Flow Switch	For electric heater control	
17	Electric Heater	Multi bank heater with thermostat and thermometer	
18	Pre-Filter	With 2 pcs of pleated paper cartridge type element 10 microns nominal rating	
19	Fine Filter	With 2 pcs of pleated paper cartridge type element 0.5 microns nominal rating, with pressure gauge and Pressure switch.	

Sl. N o.	Name of Item	Required specifications	Bidder's Guaranteed Particulars
20	Flow Control valve,	Diaphragm type hydraulically operated from pilot valve and liquid float located in the vacuum chamber.	
21	Vapor trap	Vapor trap with level switch	
22	Vacuum Pump	For vacuum chamber	
23	Mechanical Booster	For vacuum chamber	
24	Control Panel Board	With vacuum gauge, thermometer, compound gauge, phase rotation detector, volt meter, ampere meter, necessary lamps and switches alarms reset. Lights with on off switch for working at night. 230 volts power outlet	
25	Flow Meter	To measure the out let oil flow, keep the memory for total oil flow.	
26	Voltage Breakdown Analyzer	To test the out let oil voltage breakdown test	
27	Oil Sampling Port	Oil sampling port with valve on outlet	
28	Duty cycle	Continuous, 24/7.	
29	Live transformer service	Capability to work on energized transformer. Improving the oil quality and DGA with out de energizing the transformer	
30	Hoses 6 Each for oil circulation. 3 each for vacuum.	For transformer oil and vacuum extraction, non-clasp. 2"x10 feet with camlock male fitting on both ends, Anti-Static with built in static wire assists in dissipating static electricity. High operating temperature (-10 to +90 °C), operating pressure (Full vacuum to 150 PSI) 	
31	Fittings 6 Each type for different transformers . 1. Female to hose. 2. Male to Hose 3. Male to outer threads 4. Female to outer threads. 5. Male to inner	 	6 Each type

Sl. No.	Name of Item	Required specifications	Bidder's Guaranteed Particulars
	threads 6. Female to inner threads. 7. Hose coupler 8. Vacuum flanges. 9. Blinds (covers for different fitting) 10. Fitting storage box.		
32	Spare Parts	Filters 10 and 0.5 microns 10 each type, Strainer 4 each, Flow meter 1 each, Pressure gauge 1 each, Pressure switch 1 each, Vacuum gauge 1 each, Vacuum switch 1 each, Temperature controller 1 each	
33	Environmental Conditions	Working in any weather condition, weather proof (rain, hot, cold, snow, windy, foggy, humid, etc.)	
34	Warranty	Standard one year	
35	Accessories	Standard Accessories should be provided	
36	Weather proof Cover	Removable weather proof hard plastic cover	
37	Fire extinguisher	Fire extinguisher for insulating oil and class ABC	
38	Grounding Connections	Grounding connection with 10 meter 2AWG extra flexible cable with ground clamps. Grounding provision for oil and vacuum hoses.	
39	Warning Signs	High temperature, high pressure, high Vacuum, Electric Shock warning signs.	

Documents requirement:

1	Certificates to be supplied with the tender document	Manufacturer's EMC Certificate of Conformity
		Manufacturer's valid ISO Certificate.
		Manufacturer's Safety Certificate of Conformity.
		Manufacturer's Certificate of test Conformity
		Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	Country of origin Certificate
		Copy of Shipping documents
		Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

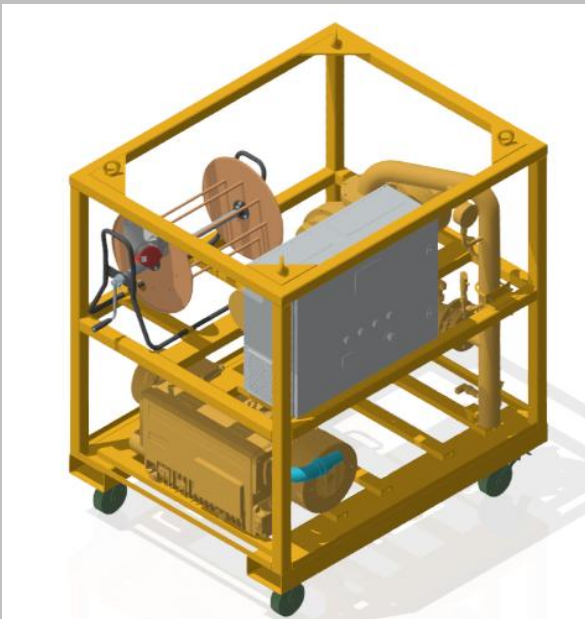
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2. Guaranteed Technical Particulars for Vacuum Pump System for Transformers.

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
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Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan	
5	Power Supply	3 Phase 4 wire 440V $\pm$ 10 % 50Hz $\pm$ 10%	
6	Capacities	Nominal suction capacity of rotary slide vane vacuum pump 2x 300m ³ /h Nominal suction capacity of roots pump 1x 2000 m ³ /h. Nominal suction capacity at 1mbar 2000m ³ /h	
7	Mounting	Trolley mounted, 4 Wheels, lift able sides cover, weather proof, towing hitch, 	
8	Guaranteed Performance	IEEE C57.93 clause 4.8.2 Vacuum treatment. Meet or exceed the acceptance limits IEEE C57.140 clause 7.1.2. a-2	
9	Alarms	High/low vacuum alarm, loss of phase, phase rotation	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
10	Connection	2 inches flange to hose 	
11	Control Panel Board	With digital vacuum gauge, phase rotation detector, volt meter, ampere meter, necessary lamps and switches alarms reset. Lights with on off switch for working at night. 230 volts power outlet	
12	Duty cycle	Continuous, 24/7.	
13	Hoses 3 Each for vacuum.	For transformer vacuum extraction, non-clasp. 2"x10 feet with flange fitting on both ends, Anti-Static with built in static wire assists in dissipating static electricity. High operating temperature (-10 to +90 °C), operating pressure (Full vacuum)	
14	Fittings 6 Each type for different transformers. Vacuum hose flanges. Blinds (covers for different fitting) Fitting storage box.		6 Each type
15	Spare Parts	Vacuum gauge 1 each, Vacuum switch 1 each	
16	Onsite training	On-site training on a working transformer with unacceptable oil quality and DGA.	
17	Environmental Conditions	Working in any weather condition, weather proof (rain, hot, cold, snow, windy, foggy, humid, etc.)	
18	Warranty	Standard one year	
19	Accessories	Standard Accessories should be provided	
20	Weather proof Cover	Removable weather proof hard plastic cover	
21	Fire extinguisher	Fire extinguisher for insulating oil and class ABC	
22	Grounding Connections	Grounding connection with 10 meter 2AWG extra flexible cable with ground clamps. Grounding provision for oil and	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		vacuum hoses.	

Documents requirement:

1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



3. Guaranteed Technical Particulars (GTP) for Vacuum/Pressure Gauge for Transformer Drying

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Manufacturer Name and Address	To be mentioned	
2	Manufacturer Type / Model	To be mentioned	
3	Application	High Precision and optical resolution Compact Vacuum Meter & Data Logger suitable for transformer.	
4	Country of Origin	USA/UK/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
5	Country of Manufacturing	USA/UK/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
6	Country of Shipment	To Be Mentioned	
7	Vacuum Gauge Type	Portable and Battery Operated with data logging facility.	
8	Measurement principle	<i>Piezo Resistive/ Heat Conduction Pirani Combination</i>	
9	<i>Measurement range</i>	<i>1200 mbar to 5E-4 mbar</i>	
10	<i>Measuring Unit</i>	<i>Mbar/ Torr/ hPa</i>	
11	<i>Measurement rate</i>	<i>1.0 s</i>	
12	Vacuum connection flange	DN 16 ISO KF	
13	Accuracy	1200 - 40 mbar: 0.3% f.s (full scale end) 40 - 2E-3 mbar: 10% f.r (from reading)	
14	Resolution	1200 -1000 mbar: 1 mbar 1000 – 1 mbar: 0.1 mbar < 1 mbar: 2 digits mantissa, 1 decimal place	
15	Materials in contact with vacuum	SS1.4307, gold, nickel, tungsten, glass, FKM	
16	Serial Interface	Mini-USB, Type B, 5 pin, female, Virtual Com port protocol	
17	Electrical Connection	Mini-jack 2.5 mm for plug-in power supply	
18	Display	LCD	
19	Power Supply	9 V Battery/ or 12-15VDC external plug-in power supply	
20	Power Consumption	Approx. 110 mW (clocked)	
21	Operating temperature	+ 5 to + 50°C	
22	Storage temperature	-20 to + 60°C	
23	Protection Class	IP 40	
24	Dimensions	To be mentioned	
25	Weight	To be mentioned	
26	Accessories	All accessories to be offered under options	
27	Warranty	Standard one year	



Documents requirement:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



4. Guaranteed Technical Particulars (GTP) for WTI/OTI Calibrator

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Manufacturer Name and Address	To be mentioned	
2	Manufacturer Type / Model	To be mentioned	
3	Application	The unit should be suitable for comparison/ Calibration of RTD, Thermocouple, Temperature switches, Thermostats and Liquid in glass thermometers, OTI and WTI gauges.	
4	Country of Origin	USA/Europe/Canada/Japan/Australia/South Korea/ Brazil/Mexico/South Africa	
5	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
6	Country of Shipment	To Be Mentioned	
7	Temp Range	55°C below ambient to +140°C	
8	Stability	0.03°C (dry block & stirred liquid bath)	
9	Uniformity	<0.008°C (Uniformity - Between Wells Dry Block Mode (Radial)) <0.02°C (Uniformity - Radial Liquid Bath Mode)	
10	Heating Times	(-)30 to 140°C in 30 Minutes (approx.)	
11	Cooling Times	140 to 0°C in 30 Minutes (approx.)	
12	Calibration Well Depth	160mm depth and 35mm dia (to allow calibration of larger dia sensors, longer sensors and simultaneous calibration of more no. of sensors at a time) Dry Well Inserts, Multiwell insert 1/8, 3/16, 1/4, 5/16 & 3/8" holes, removable/replaceable	
13	Indicator	Built-in universal sensor input allowing PRT's, T/C's, along with linear process inputs including 4-20mA current transmitters to be displayed. It should be programmable with up to 5 calibration points to provide high accuracy digital probe matching.	
14	Indicator units	C, F & K	
15	Display Resolution	Digital Display Best resolution of 0.01degC	
16	Reference PRT	Shall be compatible with the dry block temperature calibrator. (Range -50 to +250deg C) with a diameter of 4mm/ 210m length with 1.5mtr PTFE 4 wire cable Alpha of 0.003850 & stability of 0.010ohm/year. Self-heating error at 1mA of 0.004degC	
17	Stirred Liquid Container	For calibration of Liquid in glass thermometers & OTI & WTI Gauges and to accommodate different sizes of sensors. (Suitable oil to cover the entire working range shall be provided- 250ml)	
18	Computer Interface	To be provided along with Windows Driven software having capability to control, automatically log & display the temperature of bath with graphical presentation. Interface cable	



Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		to be provided	
19	Switch Testing	Switch Testing option for testing thermostats to be provided	
20	Power requirement	230 VAC ($\pm 10\%$), 50 Hz, 150 W	
21	Portability	Unit shall be light weight and shall be supplied with a sturdy carry case for the main unit as well as the accessories	
22	Dimensions (H x W x D) mm	To be mentioned	
23	Weight in kg	To be mentioned including all accessories	
24	Bill of material	The equipment shall be supplied with traceable calibration certificate, Serial Communications and Software, Reference PRT, Metal block insert & Stirred liquid container bath, manual, mains lead & sturdy carrying case for Calibrator and accessories	
26	Service & Warranty	Standard one year warranty and local service facility.	

Documents requirement:

1	Certificates to be supplied with the tender document	1. Manufacturer's EMC Certificate of Conformity
		2. Manufacturer's valid ISO Certificate.
		3. Manufacturer's Safety Certificate of Conformity.
		4. Manufacturer's Certificate of test Conformity
		5. Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	1. Country of origin Certificate
		2. Copy of Shipping documents
		3. Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



5. Guaranteed Technical Particulars (GTP) for Portable Partial Discharge (PD) Diagnostic System for High Voltage Equipment.

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Manufacturer Name and Address	To be mentioned	
2	Manufacturer Type / Model	To be mentioned	
3	Construction	Digital, Handheld PD Detector, Portable, UHF, HF, TEV, Acoustic, All in one design or with additional sensors.	
4	Application	Portable Partial Discharge Measurement for High Voltage AIS Substation Equipment, Transformers, High Voltage GIS, Indoor Switchgear,	
5	Country of Origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
6	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
7	Country of Shipment	To Be Mentioned	
8	Power Supply	Internal battery, Battery life > 4 Hours, Rechargeable Li-Ion High-capacity battery. DC Adapter 80V-260V AC	
9	Detection Frequency Range	UHF	300 MHz - 1000 MHz
		HFCT	0.5MHz-30MHz
		TEV	3MHz to 100MHz
		Acoustic	30kHz-300kHz
10	Resolution	$\pm 1.0 \text{ dB}$	
11	Accuracy	$\pm 150 \text{ kHz}$ or $\pm 1.0 \text{ dB}$	
12	Integrated /Additional Sensors:		
	HFCT	Scan for electrical evidence of PD to earth. Can be clipped on an apparatus ground wire (transformers, dead tank breakers) Frequency range 0.5MHz to 30MHz	
	UHF	UHF emission measurement from 300 MHz - 1000 MHz	
	Transient Earth Voltage (TEV) capacitive probe	Find PD in metal-clad switchgear (GIS). Frequency range 3MHz to 100MHz	
	Acoustic	acoustic measurement verifies real PD Frequency range 30KHz to 300KHz	
13	DATA STORAGE AND TRANSFER		
	Internal	Built-in storage Memory min 4GB	
	External	USB storage class compliant USB Flash Drive / Hard Disk Drive	
	Data Transfer	Through USB	
14	Operating Environment:		
	Temperature Range	0 to +50 °C	
	Relative Humidity	< 90% (non-condensing)	
15	Environmental Protection:	IP57 (protected against dust, water)	
16	Dimensions (H x W x D) mm	To be mentioned	
17	Weight in kg	To be mentioned including all accessories	



Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
18	Rugged PC (Minimum Requirements) 	Operating System: Windows 10 Pro with upgrade for W11 Mobile Computing Platform: Intel® Core™ i5-1145G7 vPro® Processor, Max. 4.4GHz with Intel® Turbo Boost Technology, 8MB Intel® Smart Cache VGA Controller: Intel Iris X Graphics. Display : 14" TFT LCD HD (1366 x 768), Protection film Storage & Memory: 16 GB DDR4 512GB PCIe NVMe SSD Keyboard: LED backlit membrane keyboard Pointing Device : Touchscreen, Touchpad I/O Interface Audio in/out combo x 1, DC in Jack x 1, USB 2.0 x 1, USB 3.2 Gen 2 Type-A x 2, Thunderbolt™ 4 Type-C x 1 LAN (RJ45) x 1, HDMI 2.0 x 1, Docking connector x 1. Security Features: TPM 2.0, Kensington lock, vPro® Technology Communication Interface: 10/100/1000 base-T Ethernet, Wi-Fi 6 AX201, 02.11ax, Bluetooth (v5.2), 4G LTE mobile broadband with integrated GPS Power: AC adapter (90W, 100-240VAC, 50/60Hz) with Bangladesh plug, Li-ion battery (10.8V, typical 6900mAh; min. 6600mAh), 2nd battery (10.8V, typical 6900mAh; min. 6600mAh). Rugged Features: MIL-STD-810H certified, IP53 certified, splash resistant keyboard, Vibration & 3ft (0.9m) drop resistant, Sealed ports and connectors. Shock-protected removable SSD. Environmental Specifications: Temperature: Operating: -29°C to 63°C / -20°F to 145°F Storage: -51°C to 71°C / -60°F to 160°F Humidity: - 95% RH, non-condensing	
18	PC Software	Name & version of the Software to be mentioned. (Full analysis and reporting software to be included free of cost with the supply. The software shall be windows operating system license free and all upgrades for the software to be provided free of cost. The Software shall have minimum of the following features: Complete Analysis of the PD Detection. Reporting and printing. Data export-CSV/PDF.	
19	Accessories to be supplied	Each unit with power supply and battery	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		pack charger (including mains adapters) Software with free software upgrades for life; rugged, hard carrying case; transport bag; adjustable hand strap; printed user's manual; Training CD/DVD.	
21	Service & warranty	Standard one year warranty and local service facility.	

Documents requirement:

1.	Certificates to be supplied with the tender document	1. Manufacturer's EMC Certificate of Conformity
		2. Manufacturer's valid ISO Certificate.
		3. Manufacturer's Safety Certificate of Conformity.
		4. Manufacturer's Certificate of test Conformity
		5. Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	1. Country of origin Certificate
		2. Copy of Shipping documents
		3. Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



6. Guaranteed Technical Particulars (GTP) for Sweep Frequency Response Analyzer (SFRA)

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Description of the Item	High frequency performance response analyser	
2.	Name of the Manufacturer	To be mentioned	
3.	Address of the manufacturer	To be mentioned	
4.	Type	To be mentioned	
5.	Model number	To be mentioned	
6.	Country of origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
7.	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
8.	Country of Shipment	To be mentioned	
9.	Standards	IEC 60076-18, IEEE C57.149, CIGRE	
10.	General		
11.	Power Supply	AC 100-250V Min	
12.	Internal Battery (optional)	> 30Wh/3 Ah	
13.	Dimensions	To be mentioned	
14.	Transport Case	To be mentioned	
15.	Weight (Instrument)	To be mentioned	
16.	Weight (Case and accessories)	To be mentioned	
17.	Environment		
18.	Application Field	Grid Substations	
19.	Ambient Temperature (operating)	-10 C to 55 C	
20.	Humidity	< 95% RH	
21.	Measurement Specification		
22.	Test Method	Sweep frequency (SFRA)	
23.	Frequency Range	1 Hz – 25MHz minimum	
24.	Frequency Resolution	Min 0.01%	
25.	Frequency Accuracy	Min 0.01%	
26.	Level Resolution	Min 0.001 dB	
27.	Number of points	Above 30000.	
28.	Measurement time	< 50 second	
29.	Points spacing	Log or Linear	
30.	Sweep Settings	To be mentioned	
31.	Accuracy	±0.1 dB from +10dB down to -40dB, ±0.5dB down to -140dB Minimum	
32.	Internal Noise Level (20Hz to 2Mhz)	< -120 dB	
33.	Dynamic Range	>120dB	
34.	Import / export of results	SFRA software should have facility to import test results of other make on SFRA kits for comparison results.	
35.	IF Bandwidth	Direct sampling of the results at	



Sl. no.	Description	Required Specification	Bidder's Guaranteed
		100MHz	
36.	USB	Yes	
37.	Bluetooth	Yes	
38.	Software	Yes	
39.	Standards	IEC 60076-18, IEEE C57.149, CIGRE	
40.	Ground Loop detection	Yes	
41.	Analog Output		
42.	Channel	1	
43.	Compliance Voltage	To be mentioned	
44.	Measurement Voltage at 50 Ohm	To be mentioned	
45.	Output Impedance	50 Ohm	
46.	Protection	Yes	
47.	Frequency Range	1 Hz – 25MHz minimum	
48.	Sweep Direction	Low to High or High to Low	
49.	Analog input		
50.	Channels	2	
51.	Sampling	To be mentioned	
52.	Frequency range	1 Hz – 25MHz minimum	
53.	Input Impedance	50 ohm	
54.	Sampling Rate	Min 100MS/s	
55.	Accessories		
56.	Standard Accessories	Mains Power Cable Communication Cable Bluetooth Adapter PC Software Verification box with three coaxial cables (Red, Blue, Yellow)-10 meter each-1 set. Large Signal C Clamp- 2 pcs Small Ground C Clamp- 2 pcs Ground Cable with Clip- 2 pcs Flat Ground Cable- 2 pcs Transport Case Any Other	
57.	Spare Parts (if need)	Yes	
58.	Manual	Yes	
60	Warranty	Standard one year	

Documents requirement:

1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents



		Valid Calibration Certificate
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Seal & Signature of the Bidder/Tenderer	Seal & Signature of the Manufacturer
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7. Guaranteed Technical Particulars (GTP) for Current and Voltage Transformer Test Equipment

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan	
5	Power Supply	Single Phase 230V $\pm$ 10 % 50Hz $\pm$ 10%	
6	Standards	ANSI / IEEE C57.13.1, IEC-60044-1	
7	Range	Ratio and accuracy, 0.5 to 10000:1 $\pm$ 1%	
8	Mounting	Portable, with hard durable weather proof carrying case 	
9	Features	Voltage output 0-2500V@ 1.2A, Voltage reading 100mV $\pm$ 0.2%, 1V $\pm$ 0.1%, 50V $\pm$ 0.1%, 1000V $\pm$ 0.1%, Current reading, 0 to 1.9999 A RMS $\pm$ 0.5%, Ratio and accuracy, 0.5 to 10000:1 $\pm$ 1% Phase angle, $\pm$ 180 Degrees / 0.0 to 359.9 degrees $\pm$ 1degree Winding resistance, 0-1.9999 ohms $\pm$ 1%, 2-19.999 ohms $\pm$ 1% Insulation resistance 2M to 1G-ohms $\pm$ 3% Current source 0-20A @ 20VAC Cont. Load burden display 19.999 A rms $\pm$ 1% / 19.999V rms $\pm$ 1% / 400VA / Z:1m Ω -1k Ω Data storage Up to 200 files with up to 10 excitation	

Sl · n o.	Description	Required Specification	Bidder's Guarantee d Particulars
		curves per file Test plans Up to 100 test plans Display) bright color LCD display Printer 40 characters, commercial thermal paper PC connection USB, RS-232C, USB memory stick Software included Memory Stick 100 MB+ Approvals EN 61010:2001, EN 61326-1:1997 Class A Heavy duty Extra-durable carrying case with handle and wheels All tests, Single Test Sequence Automatic & Manual Modes Automatic & Manual demagnetizing Automatic knee point detection (ASA 10/50, IEEE 30°, IEEE 45°) Includes 5 low side taps and 1 high side tap Full Keypad	
10	Environmental Conditions	-10 to 60°C, indoor/outdoor in fair weather Humidity <95% non-condensing Altitude <3300 ft. (1000 meters)	
11	Warranty	Standard one year	

Documents requirement:

1.	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



8. Guaranteed Technical Particulars (GTP) for Harmonic & Power Quality Analyzer

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

S l. n o .	Description	Required Specification	Bidder's Guarante ed Particular s
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan	
5	Power Supply	Single Phase 230V $\pm$ 10 % 50Hz $\pm$ 10% for Vacuum/Filling pump	
6	Standards	IEC 61000-4	
6	Range	Maximum Input Voltage 0 to 1000 volts 3 phases and neutral, in put impedance 10 M Ω between P-P and P-N, 5 M Ω between P-PE and N-P Current Inputs 3 phases and neutral wit clamps with 15 mV output or Rogowski Coil 15 mV input impedance 11 k Ω Bandwidth DC to 30 kHz	
7	Mounting	Portable 3 Phase Harmonic & Power Quality Analyzer 	
8	Features	● Display TFT, 1024 x 600 pixels with capacitive touch that supports operation with PPE gloves user configurable ● Voltage source measurement 0 to 1000 volts 3 phases and neutral, in put impedance 10 MΩ between P-P and P-N, 5 MΩ between P-PE and N-P ● Current Inputs 3 phases and neutral wit clamps with 15 mV output or Rogowski Coil 15 mV input impedance 11	

		kΩ • Bandwidth DC to 30 kHz • Measurement IEC 61010-2-030: Overvoltage CAT IV 300 V, CAT III 600 V • Trigger Adjustable Volts, current, frequency, power, reactive power, • Data Storage 8 GB or more Internal 64 GB or more micro SD card 10 logging sessions of 8 weeks with 1minute intervals and100 events • Real-Time Accuracy <1 ms absolute to UTC • Harmonics ih0 to ih50 • Events, Voltage Dip, swell, interruption, rapid voltage change, waveshape deviation, transients Current Inrush current • Triggered Recordings Half cycle RMS of voltage and current for 10 s • Transients 1 MS/s • Ethernet 1 Gbit/s 1000BASE-T • USB 2.0 high speed for USB flash drives to transfer measurement data, firmware updates, and license installation	
9	Environmental Conditions	-10 to 60°C, indoor/outdoor in fair weather Humidity <95% non-condensing Altitude <3300 ft (1000 meters)	
10	Warranty	Standard one year	

Documents requirement:

1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



9. Guaranteed Technical Particulars (GTP) for Transformer Turns Ratio Tester

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Description of the Item	Supplying of brand-new Transformer Turns Ratio Tester having high accuracy and high quality.	
2.	Name of the Manufacturer	To be mentioned	
3.	Address of the manufacturer	To be mentioned	
4.	Type/ Model number	Shall be mentioned	
5.	Country of Manufacturer	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
6.	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
7.	Country of Shipment	To be mentioned	
8.	Standard	EN 61326-1:2006, 2014/30/EU,	
9.	Measurement	a. Turn Ratio b. Turns Ratio deviation calculation. c. Phase Angle d. Excitation Current e. Automatic Vector group detection f. Magnetic Balance Test	
10.	Test Voltage	1 V to 250 V	
	Frequency	50Hz	
11.	Output Current Capacity	≥500mA	
	Measuring Ranges		
12.	Turn Ration	1 to 25000 or better	
	Excitation Current	0 to 2A	
	Phase Angle	0-360°	
	Accuracy		
13.	Turn Ratio	≤±0.2%	
	Excitation Current	≤±3%	
	Phase Angle	≤±1 degree	
14.	Display	LCD Display with backlight, visible in bright sunlight	
15.	Store test data	Shall be mentioned	
16.	USB Connectivity	Yes	
17.	Built in Printer	Yes	
	Environmental Conditions		
18.	Operating Temperature	-10°C to 55°C	
	Storage Temperature	-20°C to 70°C	
	Relative Humidity	95% or better	
19.	Analysis and Reporting Software	Shall be provided	
20.	Dimension (Lx W x H)	To be mentioned	
21.	Weight	To be mentioned	
22.	Warranty	Standard one year	
23.	Accessories	Standard Accessories should provide	

Documents requirement:



1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



10. Guaranteed Technical Particulars (GTP) For Circuit Breaker and Coil Analyzer Test Set

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Description of the Item	Circuit Breaker and Coil Analyzer	
2.	Application	132kV Live Tank and Dead Tank CB, 230kV Live Tank SF6 CB, 132kV and 230 kV GIS CB, 400kV Live Tank CB etc.	
3.	Name of the Manufacturer	To be mentioned	
4.	Address of the manufacturer	To be mentioned	
5.	Type	To be mentioned	
6.	Model number	To be mentioned	
7.	Country of origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
8.	Country of made	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
9.	Country of Shipment	To be mentioned	
10.	Standards	IEC/IEEE/CIGRE/ANSI	
10.	Power Supply		
	Mains input	100 – 250 V AC, 50 Hz,	
	Power consumption	To Be Mentioned	
11.	Timing Measurement Module of Main Contact & PIR		
	No of channels	06 (Six channels)	
	Time base inaccuracy	±0.01% of reading ± 1 ms	
	Resolution	0.05 ms (Min)	
	Sample rate	40 KHz Min	
	PIR Timing	Yes	
	Supported PIR types	Linear PIR	
	PIR resistance range	10Ω – 5k Ω	
	PIR Inaccuracy (Max)	±10% of reading ± 0.1% of range	
	Contact test voltage	<30 V DC ± 20%	
	Test current	100 mA or more	
	Break per phase	Min two Interrupter per phase measurement	
	Grounding	Circuit breaker both Sides grounding facilities during single and two break measurement testing.	
	Supported sequences	C, O, C-O, O-C, O-C-O	
	GIS CB Testing	Yes	



Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
	Facility		
12	Timing Measurement Module of Auxiliary Contact		
	Timing of a and b auxiliary Contact	Yes	
	No. of channels	06 (Six channels)	
	Time base Inaccuracy (Max)	$\pm 0.01\%$ of reading ± 1 sample interval	
	Sample rate	40KHz Min	
	Dry and wet auxiliary Contact	Yes	
	Contact Open circuit voltage	$< 40 \text{ V DC} \pm 20\%$	
	Contact Short circuit current	$< 50 \text{ mA}$	
	Input voltage range	10-250 V AC, 10-300 V DC	
	Input Trigger voltage range	10-250 V AC, 10-300 V DC	
	Threshold level	User configurable	
13	Coil related measurement		
	Number of coil circuits	2, 4 or 6	
	Coil current ranges	0 to 30 Amps	
	Coil Voltage range	0-250 V DC/AC	
	Coil resistance Measurement	Yes	
	Resistance Measurement range	To be mentioned	
	Coil current accuracy	$\pm 1\%$ of reading $\pm 0.1\%$ of range	
	Coil Voltage accuracy	$\pm 1\%$ of reading $\pm 0.1\%$ of range	
	Under voltage trip testing	To be Mentioned	
	Minimum pickup volt. testing	To be Mentioned	
14	Static & Dynamic Resistance Measurement		
	Contact Resistance	Performed Static and Dynamic resistance with electronically stabilized current source.	
	Accuracy (Min)	$1\% \pm 1\mu\Omega$	
	Static Resistance Measurement	200 A Minimum	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
	current		
	Resolution	0.1μΩ	
15	Motion analysis		
	No of channels	03 (Three channels)	
	Transducer	Liner or Rotary	
	Voltage range	250V	
	Resolution	0.3mV	
	Sampling Rate	40 kHz	
	Environment & Others		
16	Operating temperature	10°C to 50°C	
	Humidity	20% - 85% RH	
	Dimension	To be mentioned	
	Standard followed for safety and EMC conformity	To be mentioned	
	All necessary accessions	To be mentioned	
	Safety of testing	Dual ground / grounding of both sides of circuit breaker	
18	Warranty	Standard one year	

Documents Requirement:

1	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate



Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



11. Guaranteed Technical Particulars (GTP) for Handheld Dynamic Micro Ohm Meter

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
01.	Description of the Item	Supplying of brand new Hand-held Dynamic Micro ohm meter) having high accuracy and high quality without disturbance in high electromagnetic field.	
02	Name of the Manufacturer	To be mentioned	
03	Address of the manufacturer	To be mentioned	
04	Type	To be mentioned	
05	Model number	To be mentioned	
06	Country of origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
07	Country of manufacture	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
08	Country of Shipment	To be mentioned	
09	Standard (Safety, EMC, Performance)	IEC	
10	Power Supply	Battery operated	
11	Weight (Max)	1 Kg (Main Instrument Only)	
12	Kelvin Four-Terminal Measurement	Yes	
13	Dual Ground	Yes	
14	Data Transfer	Bluetooth	
15	Operating time	10 hours (minimum)	
16	Charging time	3 hours (maximum)	
17	Measurement Range	0.1 $\mu\Omega$ to 1000 m Ω	
18	Accuracy	± 0.1 % of reading ± 0.1 of range up to 1 Ω Range ± 0.5 % of reading ± 0.5 of range From 1 Ω to 3 Ω Range	
19	Resolution	1-999.9 $\mu\Omega$ 0.1 $\mu\Omega$ 1.000-9.999 m Ω 0.01 m Ω 10.00-99.99 m Ω 0.1 m Ω 100.0-1000 m Ω 1.0 m Ω	
20	Test current range	10A to 200A	
	Test current range Accuracy:	$\pm 2\%$ ± 2 A	
21	Selectable Test Current Stage	To Be Mentioned	
22	Storage Capacity	Min.100 results sets	
23	Single compact unit	Yes	
24	Test Modes	Manual, Auto, Continuous.	
25	Storage Capacity:	Min. 100 results sets & memo	
20	Suitable calibration shunt	Yes	
26	Provision to preset the injection current value	Yes	



27	Single compact unit	Yes	
28	Display	LCD	
29	CE marked to ensure electromagnetic compatibility	Yes	
30	Inbuilt protection for: Over voltage, over current, Short circuit	Yes	
31	Shock & Vibration	Tested as per IEC standard	
32	Temperature operation	0-50 ⁰ C	
33	Temperature storage	-10-55 ⁰ C	
34	Max Humidity	95% RH noncondensing	
35	Dimension	To be mentioned	
36	Ingress protection	IP54	
37	Warranty	Standard one year	
38	Accessories	a) USB Flash Drive including PC Software b) User Guide on CD-ROM c) Quick start guide in English d) Battery Charger e) Transport case e) Ground(PE)cable f) Test cables with Kelvin probes (current & sense) 2x1.3m (4 ft.) (one with trig button), 200 A or rated current g) Test cable with Kelvin clamp 2 x 5.0 m (16 ft.) black, 200A or rated current h) Others necessary accessories. (if needed)	
39	Safety and EMC conformity	Yes	
40	Standard followed for safety and EMC conformity	Shall be mentioned	
42	Warranty	Standard one year	

Documents requirement:

1.	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



12. Guaranteed Technical Particulars (GTP) for AC/DC Power Supply for Testing Circuit Breakers

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

S l. n o .	Description	Required Specification	Bidder's Guarantee d Particulars
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan	
5	Power Supply	Single Phase 230V $\pm$ 10 % 50Hz $\pm$ 10% for input/ output oil pump.	
6	Output Range	Voltage 10V AC/DC to 250VAC/VDC 35 A DC. Ripple free DC-voltage with output protection.	
	standards	IEC 62271-100, ANSI C37.09	
7	Mounting	Portable with lifting handle and carrying case. 	
8	Features	• Main power circuit breaker switch (with indicator) • Manual control of output voltages • Zero Start interlock • Digital, LCD showing voltage and current • USB port for data acquisition via USB drive • Computer/printer interface.	
9	Cables	Extra flexible out put power 10'.	
10	Environmental Conditions	10-40°C, indoor/outdoor in fair weather Humidity <95% non-condensing Altitude <3300 ft (1000 meters)	

1 1	Warranty	Standard one year	
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Documents requirement:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



13. Guaranteed Technical Particulars (GTP) for SF₆ Gas Analyzer Test Set

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
11.	Description of the Item	SF ₆ Gas Analyzer	
12.	Name of the Manufacturer	To be mentioned	
13.	Address of the manufacturer	To be mentioned	
14.	Type	To be mentioned	
15.	Model number	To be mentioned	
16.	Country of origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
17.	Country of manufacturer	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
18.	Country of Shipment	To be mentioned	
19.	Standards	IEC/IEEE/CIGRE/ANSI	
Power Supply			
10.	Main input	100 – 250 V AC, 50 Hz	
	Supply type	1 Phase supply	
SF₆ Analysis			
11.	Measuring parameters	SF ₆ volume percentage (%), Moisture concentration, SO ₂ concentration (ppm), HF concentration (ppm), H ₂ S concentration (ppm), CO concentration (ppm) With pumping back feature after analysis. Inlet pressure: 0,2 - 50 bar Flow rate: 20 L/h (SF ₆) or better 6 m long connecting hose with DN8 and DN20 couplings, 2 m long connecting cable	
	Measuring Principle	To be mentioned	
	Measuring Range	Vol.% 0-100 Vol. %, Moisture -60 to +20 °C, SO ₂ 0 – 500 ppm, HF 0 – 10 ppm, H ₂ S 0 – 100 ppm, CO 0 – 500 ppm.	
	Measuring Accuracy	±0.5% for SF ₆ Vol, +/- 2 deg at > -40 and +/- 3 deg at < -40 deg C for Dew point., others to be mentioned	
	Internal Storage	To be mentioned	
	External Gas Collecting Unit	To be mentioned	
	Gas Emission	No	
	Measuring Time	To be mentioned	
	Data Transfer	Yes	
	Internal Data Storage	Minimum 200 records.	
12	Carry Case	Yes	
13	Battery capacity	8 hours Minimum	
14	Display	Yes	
	Accessories	Yes	
15	Printer	To be mentioned	
16	Dimension	To be mentioned	
17	Weight	To be mentioned	
19	Warranty	Standard one year	
18	Environment & Others		



	Operating temperature	10 °C to 50 °C	
	Humidity	20% - 85% RH	
	Standard followed for safety and EMC conformity	To be mentioned	
	All necessary accessories	To be mentioned	

Documents Requirement:

1	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



14. Guaranteed Technical Particulars (GTP) for High-Performance Daylight Corona Imaging Camera

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Description of the Item	CORONA IMAGING Camera in the network for inspection of overhead transmission lines and substations to detect UV discharges that is affecting the assets performance and transmission loss.	
2.	Name of the Manufacturer	To be mentioned	
3.	Address of the manufacturer	To be mentioned	
4.	Type	To be mentioned	
5.	Model number	To be mentioned	
6.	Country of origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
7.	Country of manufacturer	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
8.	Country of Shipment	To be mentioned	
ULTRAVIOLET CHANNEL			
9.	Typical Sensitivity	SB (240 - 280 nm) 2.05x10 ⁻¹⁸ Watt/cm ² , 3pC @20m (Korea Electrotechnology Research Institute IEC 60270:2000) 13.16dBμV(RIV) @ 1MHZ @10m (Korea Electrotechnology Research Institute – NEMA107-1987); Optional NSB (240-300 nm)~ 1 x 10 ⁻¹⁸ Watt/cm ² , 0.8pC @ 15 m Tested & certified by Innogy SE-Euro test Germany: IEC 60270:2000	
	Field of view	8° Horizontal x 6° Vertical ~ 10° Diagonal Zoom Range (optical): 1x Zoom Range (digital): 8° to 4°, in 1 step	
	Focus type	Linked to Visible with manual override	
	Focus Range	<0.7m to Infinity	
	Detector Life Span	No degradation	
	Corona Measure Method	Intensity based count, Calibrated for irradiance value of selected area	
	Threshold Mask	Useful range 20-100%	
	UV Transparency	0-100%	
	UV False Colour Selection	4 pre-sets with 100 user selectable hues	
	UV Integration	Adjustable period, Summation or Noise Reduction	
VISIBLE CHANNEL			
10.	Resolution	1920 x 1080 pixels	
	Sensitivity Day Mode	0.05 Lux @ F 1.6 @ 50 fps	
	Sensitivity Night Mode	0.03 Lux F 1.6	
	Exposure / Image Enhancements	Auto or Manual	
	Focus Type	Automatic with manual override	
	Focus Range	<0.7m to Infinity	
	Useful Zoom Range	16° (0.5x) to 4° (2x)	



Sl. no.	Description	Required Specification	Bidder's Guaranteed
	(optical):		
	Camera Module Zoom Range	10x Optical zoom, 53° to 4.9°	
	Zoom type	Stepped	
	Zoom Range (digital)	4x, 6x, 8x, 12x	
	Maximum IFOV	0.0445 mRAD	
	INPUT/OUTPUT & OPERATING SYSTEM		
	OS Features	Icon based menu system, 10x User Profile. Boot to inspection capable in 6s, to record capable in 60s. Image Sort Numbering. Video list and playback.	
	Input	Keypad (right hand)	
	Output	HDMI & Composite Video	
	Bi-Directional	Mini USB, RS-232	
	Firmware	Internal GPS, with external hot plug booster antenna	
	Software Update	Via files downloaded from website to Micro SD card	
	MEDIA & STORAGE		
	Storage Medium	Micro SD card (32 GB supplied with camera)	
	Storage Capacity	1000+ images or >1 hr video/GB	
	Storage Format Video	AVI, 720p (H.264 compression)	
	Storage Format Still	JPG	
	Media Download	Via Card Reader or USB	
	DISPLAY		
	Type	5.7" LCD, 640 x 480 pixels, color, manual or auto brightness up to 450cd/m2, variable angle	
	Display Modes	UV + Vis, VIS only, UV only, UV Priority	
	UV Overlay Accuracy	<1 milliarc deviation	
	On Screen Display	Gain, zoom, count, active functions	
	POWER		
	Battery	1 Li-ion, Type L compatible	
11.	Battery Location	Internal, quickly replaceable	
	Power Consumption	9 Watt	
12.	Operating Time	>3hrs maximum, 2.5hrs typical	
13.	Continuous Operation	No overheating	
14.	Charging	In camera or in external charger	
	PHYSICAL SPECIFICATION		
15.	Weight	2 kg maximum including battery	
16.	Dimensions (mm)	To be mentioned	
17.	Window aperture	Ø = 62 mm	
18.	Operating & Storage Temp	-20 °C to 55 °C	
19.	Humidity	Up to 90 %, non-compensating	
20.	Mounting Point	Standard 1/4" X20 thread tripod mount	
	PROTECTION		
21.	Storage / Transport Case:	Pelican style plastic hard case	
22.	Environmental Protection	IP54 / MIL-STD 810F (Vibration, shock, temperature, humidity)	
23.	Safety Standard	CE, IEC61010-1	
24.	Warranty	Standard one year	
	ACCESSORIES		
25.	Reporting Software	To be provide in free of cost	
26.	Carrying	Neckstrap, Camera Harness	

Sl. no.	Description	Required Specification	Bidder's Guaranteed
27.	Standard accessories	All other standard accessories need to provide.	

Documents requirement:

1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

15. Guaranteed Technical Particulars (GTP) for Multi-Range Voltage Indicator / Transmission line voltages (600V through 765 kV) tester

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan/Australia	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan/Australia	



Sl. no .	Description	Required Specification	Bidder's Guaranteed Particulars
5	Power Supply	Alkaline or Lithium batteries	
6	Standards	OSHA 1910.269	
7	Range	600V through 765 kV live line tester.	
8	Mounting	 Portable, with hard durable weather proof caring case 	
9	Features	Selectable 600V through 765 kV AC (alternating current/alternating voltage) only indicator (not to be used to detect DC) MRVI Remote Application (Apps) Maximum voltage hold Data holding Bluetooth connectivity with phone or computer To determine if power lines are at rated voltage, have induced voltage, or are de-energized For overhead and underground systems (with appropriate adapters and Hot Sticks) For overhead and underground systems Phase-to-Phase and Phase-to-Ground reading ranges Manually activated Hold Mode with a storage bag with a snap hook designed to attach to a lineman's belt	
10	Environmental Conditions	-10 to 60°C, indoor/outdoor in fair weather Humidity <95% non-condensing	
11	Warranty	Standard one year	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

 Seal & Signature of the Bidder/Tenderer

 Seal & Signature of the Manufacturer
16. Guaranteed Technical Particulars (GTP) for Laser Rangefinder

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no	Description	Required Specification	Bidder's Guaranteed Particulars
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan/Australia	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan/Australia	
5	Power Supply	Alkaline or Lithium batteries	



6	Standards	IEC 60825-1, 2014-5, (EMC) 89/336/EEC of May 3, 1989 as amended by 93/34/EEC of April 28, 1992 and 93/68/EEC, Article 5 of July 22, 1993.	
7	Range	Measurement Range: 0 to 1,000 m typical, 2,000 m max to reflective target Inclination: ± 90 degrees	
8	Mounting	Portable, with hard durable weather proof caring case 	
9	Features	Measurement Modes: Horizontal Distance, Vertical Distance, Slope Distance and Inclination (or Percent Slope), 3-point flexible Height Routine with auto sequencing, and 2-shot Missing Line Routine. Max Range to Reflective Targets: 2500 m or more Distance Accuracy to Typical Targets: ± 5 cm Measures Azimuth with TruVector: Yes Azimuth Accuracy: $\pm 0.5^\circ$ Typical Inclination Accuracy : $\pm 0.1^\circ$ Typical Data Communication: Serial, via wired RS232 and wireless Bluetooth Scope Magnification: 7X In-Scope Display: LCD Point finder: with 4x zoom camera and red-dot laser RS232 serial and Bluetooth wireless communication. The laser sensor, integrated tilt sensor and compass measure slope distance, horizontal distance, vertical distance, inclination (or percent slope), azimuth, or instantly calculate the height of any object or the missing line between two points remote from your position Self-Calibration Impact, water and dust resistant NEMA 3, IP 54	
10	Environmental Conditions	-10 to 60°C, indoor/outdoor in fair weather Humidity <95% non-condensing	
11	Warranty	Standard One year	

Documents requirement:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

17. Guaranteed Technical Particulars (GTP) for Safety ground for Transmission Line and Substation Equipment

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

S l. n o .	Description	Required Specification	Bidder's Guaranteed Particulars
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan/Australia	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan/Australia	
5	Standards	IEEE1246-2011, IEC 60227-1, ASTM F855, ASTM B8	
6	Range	43 KA for 15 cycles	
7	Mounting	Portable safety ground 	
8	Features	43 KA for 15 cycles Mounting with insulated hot sticks Copper C-type clamps in Snap-On Flat-Face Transparent extra flexible cables Crimp ferrule	
9	Environmental Conditions	-10 to 60°C, indoor/outdoor in fair weather Humidity <95% non-condensing	
10	Warranty	Standard One year	

Documents requirement:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

18. Guaranteed Technical Particulars (GTP) for Clamp on Ground Resistance Tester for Towers and Poles.

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan/Australia	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan/Australia	
5	Standards	ANSI/IEEE Std 81-1983, IEEE Std 1048-1990, EN 61010-1, 600 V CAT IV	
6	Range	0.010 to 1500 Ω , 0.200mA to 40 A,	
7	Mounting	Hand held clamp on ground ground resistance tester for transmission line towers and poles	
			
8	Features	Ground Resistance: 0.010 to 1500 Ω Current Measurement: 0.200mA to 40 A Selectable Measurement Frequency: 50, 60, 128 or 2083 Hz Current Measurement Frequency: 47 to 800 Hz Inductance Measurement: 10 to 500 μ H Communication: Bluetooth connection and USB Data storage: 2000 measurements with time-stamping Data view software: Included Wrist strap calibration loop: Included Auto Range Auto off Buzzer alarm for out of range voltage and current	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		Digital Display	
9	Environmental Conditions	-10 to 60°C, indoor/outdoor in fair weather Humidity <95% non-condensing	
10	Warranty	Standard one year	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



19. Guaranteed Technical Particulars (GTP) for Temporary Ground Rod at Transmission Line Site

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan/Australia	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan/Australia	
5	Standards	ASTM Grade 3	
6	Range	Fault Current - 30 Cycles 20000 A	
7	Mounting	Temporary Screw-In Ground Rod for transmission line towers and poles  	
8	Features	The 6' copper spiralled ground rod develops less resistance than straight ground rods	
9	Environmental Conditions	-10 to 60°C, indoor/outdoor in fair weather Humidity <95% non-condensing	
10	Warranty	Standard one year	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.

2	Document to be supplied during supply	• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
		• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

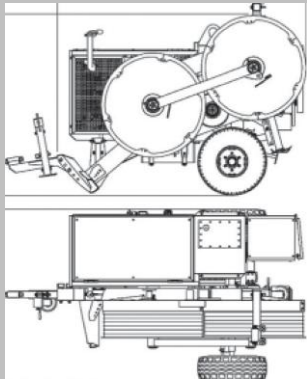
Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

20. Guaranteed Technical Particulars (GTP) for Hydraulic Puller-Tensioner (Stretching Winch)

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

a) Stretching Winch

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	HYDRAULIC PULLER-TENSIONER (STRETCHING WINCH)		
	HYDRAULIC PULLER-TENSIONER 90 KN CAPACITY FOR BUNDLE CONDUCTOR DESIGNED TO BE USED AS A TWIN INDEPENDENT ADHERENCE-WHEELS (45+45 KN) AS WELL AS OPGW CABLE STRINGING OPERATIONS Standard features • 2 hydraulic circuit with negative brake system • - Mechanical Bull-wheel coupling system • - 2 dynamometers for direct reading of pulling value with load-limiter device (puller-mode) • - 2 Counter-meter device • - 2 sets of quick release hydraulic connectors to feed up to 2 remote reel-stands or reel-winder units • - Thermally treated steel adherence wheels • - Gear box (2 speed) on first circuit only • - Wired remote control unit c/w console • - Hydraulic stabilizers • - Balanced top lifting point and anchoring attachments		

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Country of manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1			
2.1.1	Indicative dimensions	Point 2.1	
2.2	Puller Performance		
2.2.1	Minimum pull	90 (or 2x45) kN	
2.2.2	Minimum Pull at max speed	35 kN	
2.2.3	Speed min.	5 km/h	
2.2.4	Minimum speed at max pull	2 km/h	
2.3	Tensioner performance		
2.3.1	Minimum tension	90 (or 2x45) kN	
2.3.2	Minimum speed	5 km/h	
2.4	Engine	51 (min) kW	
2.5	Max Weight	7500 kg	
2.6	Adherence-wheels Diameter	1500 mm	
2.7	Max conductor diameter	40 mm	
2.8	Optional equipment required		
2.8.1	Pre-set for digital data recorder, counter-meter and speedometer		
2.8.2	Wireless remote control unit c/w console		
2.8.3	Adherence wheels with interchangeable Nylon liners		
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

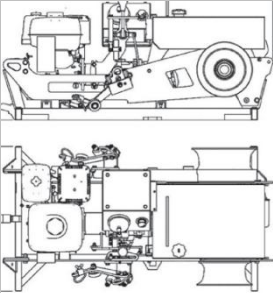
Seal & Signature of the Manufacturer



21. Guaranteed Technical Particulars (GTP) for Service Winch

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

1) Service Winch

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	<u>Real stand</u>		
	This Service Winch is used to lift loads and to build pylons Standard features • hydraulic circuit with negative brake system • -dynamometer for direct reading of pulling value with load-limiter device • Rope holder clamps for large-groove capstans • Balanced top lifting point and anchoring attachments		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1			
2.1.1	Indicative dimensions	Point 2.1	
2.1.2	Minimum pull	15 kN	
2.1.3	Minimum Pull at max speed	7 kN	
2.1.4	Speed min.	2 km/h	
2.1.5	Minimum speed at max pull	0,7 km/h	
2.1.8	Engine	12 (min) kW	
2.1.9	Max Weight	400 kg	
2.1.10	Capstans diameter	200- 250 mm	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



22. Guaranteed Technical Particulars (GTP) for Coil

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

1) Coil mod 1

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Coil		
	The rope coil is a tool for winding wire and fiber ropes		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Dimension		
2.1			
	Dimension	mm	
2.1.1	Dimension (A)	420 ±10	
2.1.2	Dimension (B)	560 ±10	
2.1.3	Dimension (C)	570 ±10	
2.1.4	Dimension (D)	1100±30	
2.2	Characteristic		
	The rope coil is made of steel tubes and consists of parts welded together and coupled by steel bolts.		

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.2.1	It consists essentially of: - a cylindrical drum with fixed parallel sides; - two spokes with hub (one for each side) that coupled to the drum allow it to rotate, by means of a pin, around its axis.	Corrosion-protected steel	
2.2.2	Max Weight	55 kg	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

2) Coil mod 2

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Coil		
	The rope coil is a tool for winding wire and fiber ropes		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Made in	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Dimension		
2.1			

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
	Dimension	mm	
2.1.1	Dimension (A)	420 ±10	
2.1.2	Dimension (B)	560 ±10	
2.1.3	Dimension (C)	570 ±10	
2.1.4	Dimension (D)	1400±30	
2.2	Characteristic		
	The rope coil is made of steel tubes and consists of parts welded together and coupled by steel bolts.		
2.2.1	It consists essentially of: - a cylindrical drum with fixed parallel sides; - two spokes with hub (one for each side) that coupled to the drum allow it to rotate, by means of a pin, around its axis.	Corrosion-protected steel	
2.2.2	Max Weight	75 kg	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

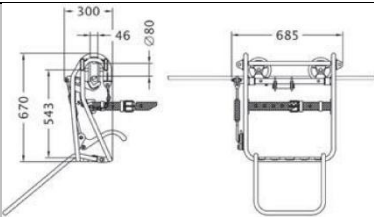
Seal & Signature of the Manufacturer



23. Guaranteed Technical Particulars (GTP) for Conductor Car for Single Conductor Inspection

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

A. CONDUCTOR CAR FOR SINGLE

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Conductor car for single		
	The conductor cars ley completes of nylon wheels on ball-bearings, stationary brake, footrest and nylon straps for back support. Made of welded aluminum alloy		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament EN 50374	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Dimensions		
2.1		Dimension mm	
2.1.1	Principal dimension	Point 2.1 Tolerance 10%	
2.1.2	Min. Working-load	100 kg	
2.1.3	Max Weight	15 kg	
2.2	Characteristic		
2.2.1	Chassis	Tubular structure for the connection of the various parts that make up the conductor car including the housing for the operator, the attachments for towing and the safety devices designed to hold	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		the conductor car to the conductor in case of overturning.	
2.2.2	Wheels	Metal wheels with groove suitable for rolling on the conductor or guard rope	
2.2.3	Parking system	The parking system, must be manually operated by means of a lever and must be equipped with a regulator designed to allow, depending on the different diameters of the conductors and guard ropes, a safe coupling of the jaw with them. The jaw that makes the coupling with the conductor or guard rope must be made of material that does not damage them and at the same time guarantees effective friction for parking.	
2.2.3	Material	welded aluminium alloy	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Documents requirement:

1	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

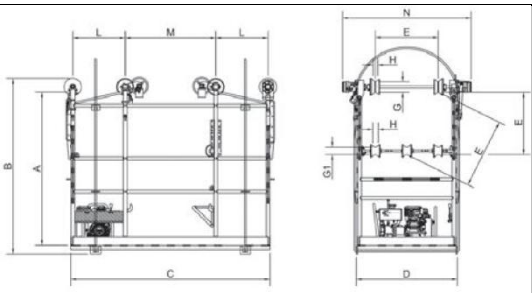
24. Guaranteed Technical Particulars (GTP) for Conductor Car for Multiple Conductor Inspection

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be



rejected)

A. CONDUCTOR CAR FOR MULTIPLE

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Conductor car for multiple		
	The conductor for the inspection of bundle conductors, is a tool suitable for transporting two people along a span of twin or three or four conductors. The model must be designed for overpassing existing spacers. Suitable for 2,3 or 4 bundled conductor configurations It must be possible to use a motorized version		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament EN 50374	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Dimensions		
2.1		Dimension mm	
2.1.1	(A) Dimension	1500 ± 50	
2.1.2	(B) Dimension	1700 ± 50	
2.1.3	(C) dimension	1900 ±50	
2.1.4	(D) Dimension	950 ±50	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.1.5	(E) dimension	400 or 600	
2.1.6	(G) Dimension	100 ± 5	
2.1.7	(G1) Dimension	70 ± 5	
2.1.8	(H) Dimension	55 ± 5	
2.1.9	(N) Dimension	1300 ± 50	
2.1.2	Min. Working-load	200 kg	
2.1.3	Max Weight (included engine)	220 kg	
2.2	Characteristic		
2.2.1	Chassis	Must be designed to allow movement with a Hydraulic driven transmission, end designed for overpassing existing spacers. aluminium traction wheels with rubber liners.	
2.2.2	Wheels	All wheels must be made of metal so as not to damage the conductor with the dimensions and tolerances shown point 2.1 The wheels must be protected by barriers designed to prevent a foreign body from being dragged and compressed between the conductor	
2.2.3	Parking system	The parking system, must be manually operated by means of a lever and must be equipped with a regulator designed to allow, depending on the different diameters of the conductors safe coupling of the jaw with them. The jaw that makes the coupling with the conductor must be made of material that does not damage them and at the same time guarantees effective friction for parking.	
2.2.3	Material	welded aluminium alloy	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.3	Gasoline Engine		
2.3.1	Power	Min. 2,5 kW	
2.3.2	Speed Conductor car	Min. 2 m/sec	
2.3.2	Slope	Min. 35%	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

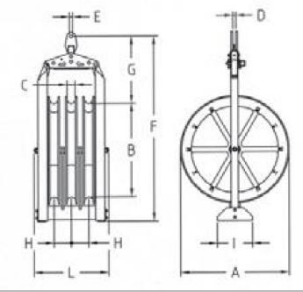
Seal & Signature of the Manufacturer



25. Guaranteed Technical Particulars (GTP) for Pulley for Multiple Conductor

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

a) Pulley for multiple conductor mod 1

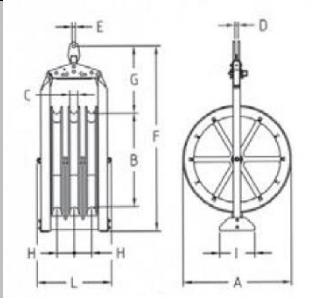
Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Pulley for multiple conductors.		
	Suitable for stringing three bundle conductors. Galvanized steel opening frame with fixed type connection, can be rotated through 90°. Aluminium alloy sheave mounted on ball bearings. Side sheaves with bottom groove protected with neoprene interchangeable ring and central sheave with bottom groove with adiprene or nylon protection		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1			
		Dimension mm	
2.1.1	Dimension (A)	770 ±10	
2.1.2	Dimension (B)	630 ±10	
2.1.3	Dimension (C)	70 ±3	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.1.4	Dimension (D)	25 ±3	
2.1.5	Dimension (H)	175±5	
2.1.6	Dimension (F)	1450 ±10	
2.1.7	Dimension (G)	630 ±3	
2.1.8	Dimension (H)	145 ±3	
2.1.9	Dimension (L)	500 ±30	
2.1.10	Dimension (I)	300 ±10	
2.1.8	Min.Working Load	60 kN	
2.1.9	Max Weight	110 kg	
2.2	Characteristic of Chassis		
	The Chassis must be shaped like an opening fork to allow the introduction of the conductor or the pulling rope with suspended pulley. Both the attachment and the opening fork must be constructed in such a way as to ensure their closure during use. On the sides of the fork, near the wheel pivot, attachments must be mounted for possible sustenance of the pulley		
2.2.1	Material of Chassis	Corrosion-protected steel	
2.3	Wheel		
2.3.1	It must be mounted on watertight or shielded and lubricated ball bearings and must have the groove bottom covered with material with a hardness lower than that of aluminium conductors. This coating has a cradle section and has the function of preventing the support of the conductors on the metal; It can be continuous or with screwed sectors and placed side by side		
2.3.2	<u>Anti-derailment device</u>	Device to prevent conductors from coming out of the throat during	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		 stretching.	
2.3	Attachment	Structural element hinged to the frame and suitable to support the pulley laying of the conductors. 	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

b) Pulled for multiple conductor mod 2

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Pulled for multiple conductor.		
	Suitable for stringing three bundle conductors. Galvanized steel opening frame with fixed type connection, can be rotated through 90°. Aluminium alloy sheave mounted on ball bearings. Side sheaves with bottom groove protected with neoprene interchangeable ring and central sheave with bottom groove with adiprene or nylon protection		

Sl. no.	Description	Required Specification	Bidder's Guarantee d Particulars
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1			
2.1		Dimension mm	
2.1.1	Dimension (A)	910 ±10	
2.1.2	Dimension (B)	770 ±10	
2.1.3	Dimension (C)	95 ±3	
2.1.4	Dimension (D)	25 ±3	
2.1.5	Dimension (H)	175±5	
2.1.6	Dimension (F)	1620 ±10	
2.1.7	Dimension (G)	660 ±3	
2.1.8	Dimension (H)	175 ±3	
2.1.9	Dimension (L)	570 ±30	
2.1.10	Dimension (I)	500 ±10	
2.1.8	Min.Working Load	60 kN	
2.1.9	Max Weight	180 kg	
2.2	Characteristic of Chassis		

Sl. no.	Description	Required Specification	Bidder's Guarantee d Particulars
	The Chassis must be shaped like an opening fork to allow the introduction of the conductor or the pulling rope with suspended pulley. Both the attachment and the opening fork must be constructed in such a way as to ensure their closure during use. On the sides of the fork, near the wheel pivot, attachments must be mounted for possible sustenance of the pulley		
2.2.1	Material of Chassis	Corrosion-protected steel	
2.3	Wheel		
2.3.1	It must be mounted on watertight or shielded and lubricated ball bearings and must have the groove bottom covered with material with a hardness lower than that of aluminium conductors. This coating has a cradle section and has the function of preventing the support of the conductors on the metal; It can be continuous or with screwed sectors and placed side by side		
2.3.2	<u>Anti-derailment device</u>	Device to prevent conductors from coming out of the throat during stretching. 	
2.3	Attachment	Structural element hinged to the frame and suitable to support the pulley laying of the conductors 	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	

Sl. no.	Description	Required Specification	Bidder's Guarantee d Particulars
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Documents requirement:

1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

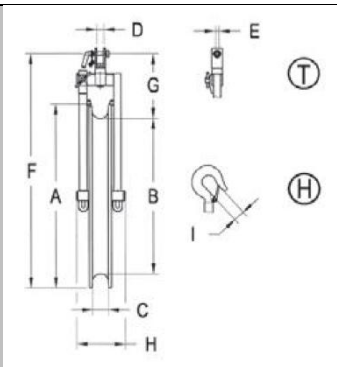
Seal & Signature of the Manufacturer

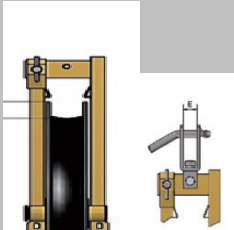
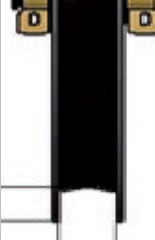


26. Guaranteed Technical Particulars (GTP) for Pulley for Single Conductor

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

c) Pulled for Single Conductor mod 1

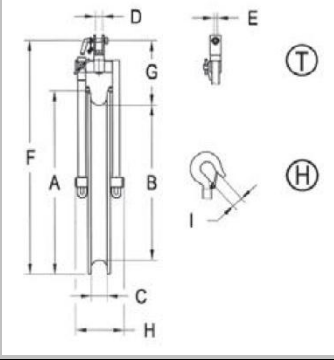
Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Pulley for single Conductor		
	The pulley for single conductors is a tool suitable for supporting and guiding conductors during the stringing or shooting adjustment phase. Molded aluminium alloy sheave on ball-bearings, interchangeable nylon lining (aluminium) sectors for conductor protection. Galvanized steel frame with clevis attachment		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1		Dimension mm	
2.1.1	Dimension (A)	770 ±10	
2.1.2	Dimension (B)	650 ±10	
2.1.3	Dimension (C)	70 ±3	
2.1.4	Dimension (D)	30 ±3	
2.1.5	Dimension (H)	175±5	
2.1.6	Dimension (F)	970 ±10	
2.1.7	Dimension (G)	270 ±3	
2.1.8	Min.Working Load	40 kN	

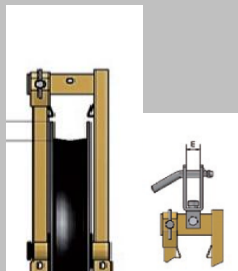
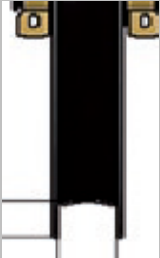
Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.1.9	Max Weight	35 kg	
2.2	Characteristic of Chassis		
	The Chassis must be shaped like an opening fork to allow the introduction of the conductor or the pulling rope with suspended pulley. Both the attachment and the opening fork must be constructed in such a way as to ensure their closure during use. On the sides of the fork, near the wheel pivot, attachments must be mounted for possible sustenance of the pulley		
2.2.1	Material of Chassis	Corrosion-protected steel	
2.3	Wheel		
2.3.1	It must be mounted on watertight or shielded and lubricated ball bearings and must have the groove bottom covered with material with a hardness lower than that of aluminium conductors. This coating has a cradle section and has the function of preventing the support of the conductors on the metal; It can be continuous or with screwed sectors and placed side by side		
2.3.2	<u>.Anti-derailment device</u>	Device to prevent conductors from coming out of the throat during stretching. 	
2.3	Attachment	Structural element hinged to the frame and suitable to support the pulley laying of the conductors. 	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
4.0	General compliance with requirements (yes/no)	Yes/No.	

1) Pulley for Single Conductor mod 2

Sl no.	Details	PGCB Requirements	Guaranteed bidder
1.	Pulled for single Conductor.		
	The pulley for single conductors is a tool suitable for supporting and guiding conductors during the stringing or shooting adjustment phase. Molded aluminium alloy sheave on ball-bearings, interchangeable nylon lining (aluminium) sectors for conductor protection. Galvanized steel frame with clevis attachment		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		

2.1				Dimension mm	
2.1.1	Dimension (A)			910 ±10	

Sl no.	Details	PGCB Requirements	Guaranteed bidder
2.1.2	Dimension (B)	770 ±10	
2.1.3	Dimension (C)	95 ±3	
2.1.4	Dimension (D)	40 ±3	
2.1.5	Dimension (H)	225±5	
2.1.6	Dimension (F)	1170 ±10	
2.1.7	Dimension (G)	340 ±3	
2.1.8	Min.Working Load	40 kN	
2.1.9	Max Weight	50 kg	
2.2	Characteristic of Chassis		
	The Chassis must be shaped like an opening fork to allow the introduction of the conductor or the pulling rope with suspended pulley. Both the attachment and the opening fork must be constructed in such a way as to ensure their closure during use. On the sides of the fork, near the wheel pivot, attachments must be mounted for possible sustenance of the pulley		
2.2.1	Material of Chassis	Corrosion-protected steel	
2.3	Wheel		
2.3.1	It must be mounted on watertight or shielded and lubricated ball bearings and must have the groove bottom covered with material with a hardness lower than that of aluminium conductors. This coating has a cradle section and has the function of preventing the support of the conductors on the metal; It can be continuous or with screwed sectors and placed side by side		
2.3.2	<u>Anti-derailment device</u>	Device to prevent conductors from coming out of the throat during stretching. 	

Sl no.	Details	PGCB Requirements	Guaranteed bidder
2.3	Attachment	Structural element hinged to the frame and suitable to support the pulley laying of the conductors. 	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

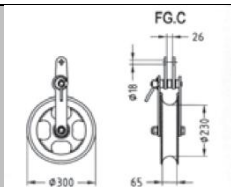
Seal & Signature of the Manufacturer

27. Guaranteed Technical Particulars (GTP) for Pulley for Grounding WIRE

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

1) Pulled for grounding WIRE

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
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Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Pulled for Grounding WIRE		
	The pulley for guard rope is a tool suitable for supporting and guiding the rope during the tensioning or adjustment of the pulls.		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1			
2.1		Dimension mm	
2.1.1	Principal dimension	Point 2.1	
2.1.2	Min. Working-load	1300 daN	
2.1.3	Max Weight	16 kg	
2.2	Characteristic		
	Galvanized steel frame with opening side. Galvanized cast iron sheave Ø bottom groove 230 mm groove width 65 mm, mounted on ball- bearings.		
2.2.1	Material of Chassis	Corrosion-protected	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		steel	
2.3	Wheel	Corrosion-protected steel	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

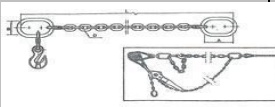
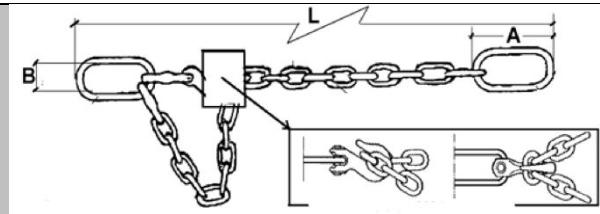
28. Guaranteed Technical Particulars (GTP) for Mooring Chain

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

1) Mooring tool

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
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Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Mooring tool		
	consists of a chain at the ends of which are connected two bells and an adjustment hook, connected to one of the bells, arranged for attachment in any link of the chain in order to adjust its length. Alternative to the chain, metal or fibre strands of different lengths, with the same mechanical properties can be used  		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	no	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1			
		Dimension mm	
2.1.1	(A) Dimension	150+5	
2.1.2	(B) Dimension	90 +5	
2.1.3	(L) Dimension	2000 +50	
2.2	Characteristic		
2.2.1	Material	steel	
2.2.2	Min.Working Load	40 kN	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.2.3	Max Weight	15 kg	
3.0	Characteristics for testing		
3.1	Coefficient of rupture (static)	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Documents requirement:

1.	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

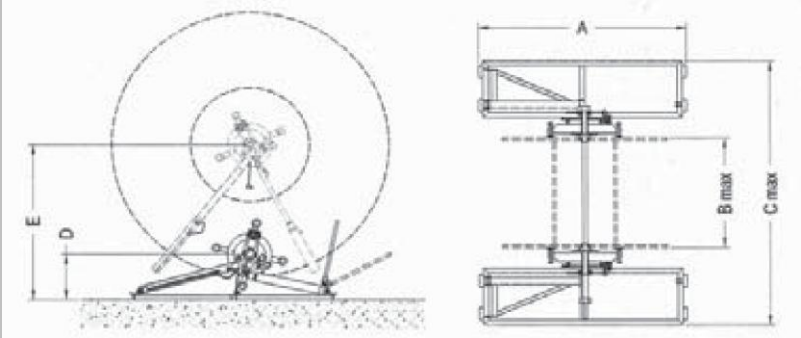
Seal & Signature of the Manufacturer



29. Guaranteed Technical Particulars (GTP) for Hydraulic Reel Stand

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

1) Hydraulic reel stand

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	<u>Hydraulic reel stand</u>		
	The coil lift stand is a tool that allows lifting by hydraulic or screw system, and the free rotation or braking of the coils during the laying phase Suitable for wooden or steel conductor drums. Nr.2 mechanical disc brakes device to control and adjust the torque force and counter-pull while unwinding the conductor.		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	no	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1	 Dimension mm		
2.1.1	Dimension (A)	1800 ±50	
2.1.2	Dimension (B)	1400 ±50	
2.1.3	Dimension (C)	2700 ± 50	
2.1.4	Dimension (D)	580 ± 30	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.1.5	Dimension (E)	1400 ± 50	
2.1.8	LIFTING CAPACITY	4000 kg	
2.1.9	Max Weight	230 kg	
2.1.10	Moment breaking	2,5 kNm	
2.2.1	Material Suspension element	Corrosion-protected steel	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



30. Guaranteed Technical Particulars (GTP) for Electrical Shear

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

1) Electrical Shear

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	<u>Electrical Shear</u>		
	This tool allows you to cut conductors and cables quickly and precisely. Must be able to cut aluminium/steel and copper cables		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directives on electrical components, e.g. European or USA Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1.1	Minimum cut diameter	80 mm	
2.1.2	Operating voltage	220 – 380 V	
2.1.3	Grid frequency	50 Hz	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	no	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	



Documents requirement:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

31. Guaranteed Technical Particulars (GTP) for Grounding Kit (High Voltage - Length 1)

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
Grounding Clamp for Line Conductor			
1	Description of the item	Duckbill or Duckbill Snap on design Spring-loaded type Ground Clamps are suitable for line conductors applied in either an upward or downward direction by an insulated operating Hot Stick.	
2	Manufacturer Name and address	To Be Mentioned	
3	Line Clamp Type	Duckbill or Duckbill Snap on design Spring-loaded type Ground Clamps	
4	Model No.	To be mentioned	
5	Country of origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
6	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
7	Country of Shipment	To be mentioned	
8	Conductor Grip Range	10 mm-40mm Dia. Or Higher	
9	Continuous Current (AMPS)	400 A	
10	Fault Current - 15 Cycles (AMPS)	Min. 43000 A	
11	Fault Current - 30 Cycles (AMPS)	Min. 30000A	
12	Eye-Screw Clamp Type	Bronze/Stainless Steel eye screw with Acme/Fine threads with high durability having a higher diameter	
13	Screw Clamp Type	Eye-Screw (Both Thread & Screw May be Bronze/Stainless Steel)	
14	Durability / Operation Cycle of Eye-Screw (1 Cycle =One Up & one Down)	To be mentioned	
15	Clamp Body	Aluminium Alloy	
16	Clamps Terminal	Tapped for 5/8-11 UNC threaded Type	
17	Ferrules	5/8 - 11 threaded ferrules (Factory Installed)	
18	Ferrules Material	Tin plated copper/ Stainless steel/ Aluminium Alloy	
19	Shrink Tubing	Yes (Tin plated copper/ Stainless steel/ Aluminium Alloy cable clamps with Clear type heat shrink sleeve)	
20	Jaw Type	Serrated Jaw having better conductivity and corrosion resistance	
21	Superior strain relief	Yes	
22	Recommended Torque (in.-lb.)	Min. 250	
23	Jumper Connection Type	2/0 Grade Cable	
24	Weight Each Clamp	≥ 0.700 Kg to ≤ 0.900 Kg	
25	Shipping Weight	To be mentioned	
26	ASTM Designation	Type 1, Class B, Grade 5/5H	
27	Fitting & Fixing	Complete Fitting & Fixing with Cable & ferrules	
28	Standard	ASTM or equivalent	
29	Warranty	Standard one year	



Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
30	Special Feature:	Catalog numbers are marked on each clamp.	
Grounding Clamp for Flat bar or Angle			
1	Description of the Item	Heavy-duty flat Jaw (Spring Loaded/Set screw on Top Jaw) Type ground clamps suitable for busbars, towers, metal poles, or other conductive structures.	
2	Manufacturer Name and address	To Be Mentioned	
3	Ground Clamp Type	Heavy-duty flat Jaw type (Spring Loaded/set screw on Top Jaw) Ground Clamps	
4	Model No.	To be mentioned	
5	Country of origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
6	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
7	Country of Shipment	To be mentioned	
8	Flat or Square Grip Range	1.5 mm-32mm Dia. Or Higher	
9	Continuous Current (AMPS)	400 A	
10	Fault Current - 15 Cycles (AMPS)	Min. 43000 A	
11	Fault Current - 30 Cycles (AMPS)	Min. 30000A	
12	T Handle-Screw Clamp Type	Bronze T Handle screw with Acme/Fine threads having higher diameter with high durability	
13	Screw Clamp Type	T Handle Screw (Both Thread & Screw May be Bronze /Stainless Steel)	
14	Durability / Operation Cycle of Eye-Screw (1 Cycle =One Up & one Down)	To be mentioned	
15	Clamp Body	Aluminium Alloy/ Bronze	
16	Clamps Terminal	Tapped for 5/8-11 UNC threaded Type	
17	Ferrules	5/8 - 11 threaded ferrules (Factory Installed)	
18	Ferrules Material	Tin plated copper/ Stainless steel/ Aluminium Alloy	
19	Shrink Tubing	Yes (Tin plated copper/ Stainless steel/ Aluminium Alloy cable clamps with Clear heat shrink sleeve)	
20	Jaw Type	Serrated Flat Jaw having better conductivity and corrosion resistance	
21	Superior strain relief	Yes	
22	Recommended Torque (in.-lb.)	Min. 250	
23	Jumper Connection Type	2/0 Grade Cable	
24	Weight Each Clamp	≥ 0.700 Kg to ≤ 0.900 Kg	
25	Shipping Weight	To be mentioned	
26	ASTM Designation	Type 1, Class B, Grade 5/5H	
27	Fitting & Fixing	Complete Fitting & Fixing with Cable & ferrules	
28	Standard	ASTM or any other equivalent international standard	
29	Warranty	Standard one year	
30	Special Feature:	Catalog numbers are marked on each clamp	
Copper stranded Extra Flexible Grounding Cable			
1	Description of the Item	Copper fine stranded extra-flexible Grounding Cable suitable for passing fault current of Conductor, bus bars, towers, metal poles, or other conductive	



Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		structures.	
2	Manufacturer Name and address	To Be Mentioned	
3	Model No	To Be Mentioned	
4	Type	Copper fine stranded extra-flexible Grounding Cable	
5	Country of Origin	USA/Europe/Canada/Japan/Australia/Korea/Brazil/Mexico/South Africa	
6	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/Korea/Brazil/Mexico/South Africa	
7	Country of Shipment	To be mentioned by the Bidder	
8	Ground Cable Size AWG	2/0	
9	Continuous Current (AMPS)	200 A	
10	Fault Current - 15 Cycles @ 60 Hz (AMPS)	Min. 27000 A	
11	Fault Current - 30 Cycles @ 60 Hz (AMPS)	Min. 20000A	
12	Rated Voltage of Cable	450/750 V	
13	Cable Overall Diameter	0.42 Inch to 0.50 Inch	
14	Conductor/Strands Diameter	0.58 Inch to 0.75 Inch	
15	Copper Purity	99.99%	
16	Total No of Fine Strands	Min 1300	
17	Usage Clamps Terminal	Tapped for 5/8-11 UNC threaded Type	
18	Jackets	Thermoplastic elastomer /T-prene rubber compound	
19	Length	Min.33 ft	
20	Ferrules Option	Yes	
21	Shrink Tubing Option	Yes	
22	Weight Per 1000 Feet	450 lbs to 550 lbs	
23	Jacket Color	Clear	
24	Shipping Weight	To be mentioned	
25	ASTM Designation	ASTM 855	
26	Fitting & Fixing	Fitting & Fixing with Both Clamps through ferrules	
27	Standard	ASTM or any other equivalent international standard	
28	Warranty	Standard one Year	
29	Additional Feature:	1. Wire range and catalog number are marked on each clamp 2. Jacketing is smooth, abrasion, weather, and oil resistant 3. Marked with AWG size approximately every 4 feet.	
30	Package (Set) Included	3x Line Clamp + 3 x Ground Clamp + 3 x Copper Stranded Ground Cable	



Document Requirements:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

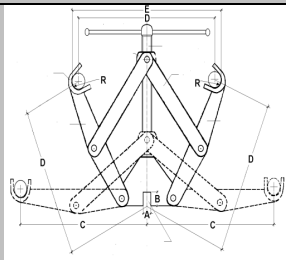
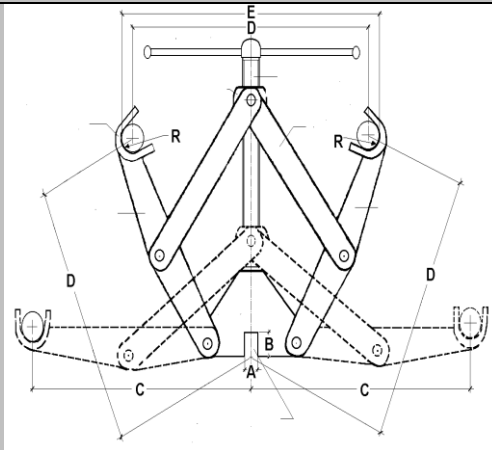
Seal & Signature of the Bidder/Tenderer

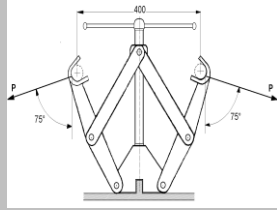
Seal & Signature of the Manufacturer

32. Guaranteed Technical Particulars (GTP) for Retractor for Trinate Conductor

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

A. RETRACTOR FOR TRINATE CONDUCTOR

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Retractor for trinate conductor		
	This tool allows you to bring the conductors from the "flat" position maintained during the stringing, to the final triangular position, to install the spacers		
1.1	Manufacturer	Insert by bidder	
1.2	Model designation	Insert by bidder	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40°C	
2.	Characteristics		
2.1		Dimension mm	
2.1.1	A Dimension	24 ± 1 mm	
2.1.2	B Dimension	25 ± 1 mm	
2.1.3	C dimension	500 ± 5 mm	
2.1.4	D Dimension	400 ± 4 mm	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.1.5	E (closed) Dimension	360 ± 10 mm	
2.1.6	R Dimension	40 ± 1 mm	
2.2.1	Material	made of stainless steel	
2.3	test example		
2.3.1	Min. Working Load (P)	1 kN	
2.4	Max Weight	12 kg	
3.0	Characteristics for testing		
3.1	Coefficient of rupture (static)	3	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Document Requirements:

1	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

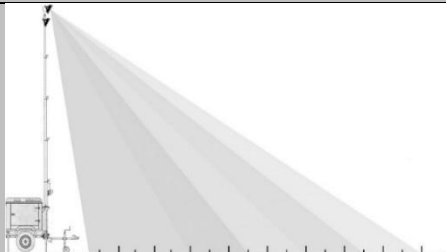
Seal & Signature of the Manufacturer



33. Guaranteed Technical Particulars (GTP) for Headlights

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Headlights

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	<u>Headlights</u>		
	Headlights		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/CEE end 2006/95/CEE	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40°C	
2.	Characteristics		
			
2.1.1	Headlights	4x320 W	
2.1.2	Headlights type	LED	
2.1.3	Lumen each	>40000 lumen	
2.1.4	Lightable area	>2500 x 5 lux	
2.1.5	Max height	>6 m	
2.1.6	Prime power	>3 kVA	
2.1.6	Autonomy with working headlights	>200 hr	
2.2	Engine		
2.2.1	Engine power	>4 kW	
2.2.2	Cooling system	Water	
2.3	Alternator	<	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.3.1	Type	Brushless	
2.3.2	Voltage regulation	Yes	
2.4	Telescopic rod with manual lifting system	Yes	
2.5	Stabilizers	4	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Document Requirements:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

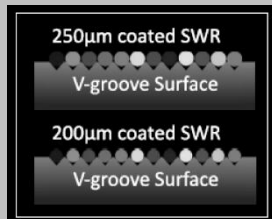
Seal & Signature of the Manufacturer



34. Guaranteed Technical Particulars (GTP) for Machine for Fiber Optic

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

1) Mass Fusion Splicer

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars					
1.	<u>Mass fusion Splicer</u>							
	Mass Fusion Splicing 1~12 fiber							
1.1	Manufacturer	Insert by bidder						
1.2	Model designation	Insert by bidder						
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan						
1.4	Standard	IEC 62496 or specific standard of IEC TC 86						
1.5	Quality Control	ISO 9001 Certification						
1.6	Type of use	Outdoors,						
1.7	Service conditions: Ambient air temperature	-5 to +40°C						
2.	Characteristics							
2.1								
2.1.1	Fiber alignment method	Self-cladding alignment						
2.1.2	Fiber count can be spliced	Single end >10						
2.1.3	Fiber splice performance	<table><tr><td>ITU-T G.652, Avg. 0.02dB</td></tr><tr><td>ITU-T G.651, Avg. 0.02dB</td></tr><tr><td>ITU-T G.653: Avg. 0.08dB</td></tr><tr><td>ITU-T G.655: Avg. 0.08dB</td></tr><tr><td>ITU-T G.657, Avg. 0.08 dB</td></tr></table>	ITU-T G.652, Avg. 0.02dB	ITU-T G.651, Avg. 0.02dB	ITU-T G.653: Avg. 0.08dB	ITU-T G.655: Avg. 0.08dB	ITU-T G.657, Avg. 0.08 dB	
ITU-T G.652, Avg. 0.02dB								
ITU-T G.651, Avg. 0.02dB								
ITU-T G.653: Avg. 0.08dB								
ITU-T G.655: Avg. 0.08dB								
ITU-T G.657, Avg. 0.08 dB								
2.1.4	Dimension W	>200mm						
2.1.5	Dimension D	<200mm						
2.1.6	Dimension H	<180mm						

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.1.6	Weight	<3 kg including battery	
2.1.7	Electrode life	>1500 splices	
2.1.8	Fiber tensile test force	=>2 N	
2.1.9	Splice time	<25 sec.	
2.1.10	Applicable protection sleeve	Heat shrinkable sleeve	
		Min. 66mm	
		min 6.0mm before shrinking	
2.1.11	Environmental condition	-5 +40 °C	
2.2.2	Display led monitor	>6 Inches Magnification > 15	
2.3.1	Illumination V grooves	Led Lamp	
2.3.2	Interface	Min. 2 USB + USB for Esternal lamp led Bluetooth	
2.3.3	Data storage	Splice mode 100 splice modes Heat mode 30 heat modes Splice result 10000 splices Splice image 100 images	
2.3.4	Automatic Function	• Splice mode select by fiber count analysis. • Fusion power calibration • Wind protector: open and dose • Heater lid: open and close • Heater clamp: open and close	
2.3.2	AC adaptor	AC 100 to 240V, 50/60Hz 1,5 A	
2.4	Standard package	(1) Battery Pack (2) AC Adapter (3) AC Power Card (4) USB Cable (5) Fusion Splicer Strap (6) Electrodes, for spare (7) Fiber Holder Set Plate (8) Carrying Case (9) Work Tray Left (10) Work Tray Righi (11) Work Tray J-Plate (12) Tripod Screw (13) Carrying Case Strap (14) Alcohol Dispenser (15) Quick Reference	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		Guide (16) instruction Manual PDF file stored in Splicer	
3.0	Characteristics for testing		
3.1	Coefficient of rupture		
3.2	Welding		
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

3) Core Fusion Splicer

Sl no.	Details	PGCB Requirements	Guaranteed bidder
1.	<u>Core Alignment fusion splicer</u>		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & manufacturer	EU/UK/USA/Japan	
1.4	Standard	IEC 62496 or specific standard of IEC TC 86	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +50°C	
2.	Characteristics		
2.1			
2.1.1	Fiber alignment method	Active core alignment	
2.1.2	Fiber count can be spliced	Single fiber	

Sl no.	Details	PGCB Requirements	Guaranteed bidder
	Applicable fiber	Single mode optical fiber Multi-mode optical fiber 80 to 125 μm	
2.1.3	Fiber splice performance	ITU-T G.652, Avg. 0.02dB ITU-T G.651, Avg. 0.02dB ITU-T G.653: Avg. 0.04dB ITU-T G.655: Avg. 0.04dB ITU-T G.657, Avg. 0.04dB	
2.1.4	Dimension W	>200mm	
2.1.5	Dimension D	<200mm	
2.1.6	Dimension H	<180mm	
2.1.6	Weight	<3 kg including battery	
2.1.7	Electrode life	>4500 splices	
2.1.8	Fiber tensile test force	=>2 N	
2.1.9	Splice time	<25 sec.	
2.1.10	Applicable protection sleeve	Heat shrinkable sleeve	
		Max. 66mm	
		Max. 6.0mm before shrinking	
2.1.11	Environmental condition	-5 +50 $^{\circ}$ C	
2.2.2	Display led monitor	>6 Inches Magnification > 150	
2.3.1	Illumination V grooves	Led Lamp	
2.3.2	Interface	Min. 2 USB + USB for External lamp led Bluetooth	
2.3.3	Data storage	Splice mode 100 splice modes Heat mode 30 heat modes Splice result 10000 splices Splice image 100 images	
2.3.4	Automatic Function	- Splice mode select by fiber count analysis - Fusion power calibration - Wind protector: open	

Sl no.	Details	PGCB Requirements	Guaranteed bidder
		and dose - Heater lid: open and close - Heater clamp: open and close	
2.3.2	AC adaptor	AC 100 to 240V, 50/60Hz 1,5 A	
2.4	Standard package	(1) Battery Pack (2) AC Adapter (3) AC Power Card (4) USB Cable (5) Fusion Splicer Strap (6) Electrodes, for spare (7) Fiber Holder Set Plate (8) Carrying Case (9) Work Tray Left (10) Work Tray Right (11) Work Tray J-Plate (12) Tripod Screw (13) Carrying Case Strap (14) Alcohol Dispenser (15) Quick Reference Guide (16) Instruction Manual PDF file stored in Splicer	
3.0	Characteristics for testing		
3.1	Coefficient of rupture		
3.2	Welding		
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Document Requirements:

1	Certificates to be supplied with the tender document	Manufacturer's EMC Certificate of Conformity
		Manufacturer's valid ISO Certificate.
		Manufacturer's Safety Certificate of Conformity.
		Manufacturer's Certificate of test Conformity
		Printed Manual/Catalogue and Brochures
2	Document to be supplied	Country of origin Certificate



.	during supply	• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



35. Guaranteed Technical Particulars (GTP) for Pressure Washer

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	<u>Pressure washer</u>		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/CE end 2006/95/CEE	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1	Electrical specification		
2.1.1	Electrical connection	220-380 V	
2.1.2	Power	4 kVA min	
2.1.3	Frequency	50 Hz	
2.1.4	Electrical cable (min.)	10 m	
2.2	Mechanical specification		
2.1.5	Indicative Dimension ((WxHxD):	630 x 550 x 1200 mm	
2.1.8	Working pressure	50--200 Bar	
2.1.9	Max day Weight	90 kg	
2.1.10	High pressure hose	>20 m	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Document Requirements:



1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



36. Guaranteed Technical Particulars (GTP) for Heavy Duty Grip Hoist (Wire Rope Puller)

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Description of the item	Heavy Duty Grip hoist for lifting, Pulling & Handling a wide variety of Loads	
2	Manufacturer Name and address	To Be Mentioned	
3	Type	Manual Operation Type Heavy Duty Grip Hoist	
4	Model No.	To be mentioned	
5	Country of Origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
6	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
7	Country of Shipment	To be mentioned	
8	Nominal Capacity	Minimum 7000 lbs	
9	Rope travel/Stroke lifting (Speed/Stroke)	Min. 28 mm	
10	Machine Dimension	To be mentioned	
11	Length of Handle (Ext./Closed)	1147/648 mm (Extendable)	
12	Machine Weight	Max. 30 Kg	
13	Steel Wire Rope	Included with necessary anchor	
14	Breaking strength of wire rope	Minimum 35000 lbs.	
15	Wire Rope Length	Standard 20 Meter	
16	Diameter of Wire rope	Min 15 mm	
17	Weight of Wire rope	Max 1.1Kg/Meter	
18	Anchor Hook	Included	
19	Wire Rope Realer	Yes	
20	Change Over Direction	Both Forward & Backward	
21	No of Changes over Leaver	2	
22	Accessories	1. Steel Wire Rope with Realer & Anchor Hook 2. Telescopic Type operating handle 3. Operation & Maintenance Catalog	
23	Standard	OSHA/ASTM/ANSI/ASME/EN or Equivalent	
24	Warranty	Standard one Year	
25	Additional Features	1. Moving & positioning formwork horizontally or vertically 2. Positioning section or precast concrete beams 3. Lifting work platforms or suspended working platforms 4. Dragging, general lifting, guying,	



		tensioning, etc. 5. Simple to feed in or remove the wire 6. Continuous Operation without Jerking 7. Less maintenance	
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Document Requirements:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

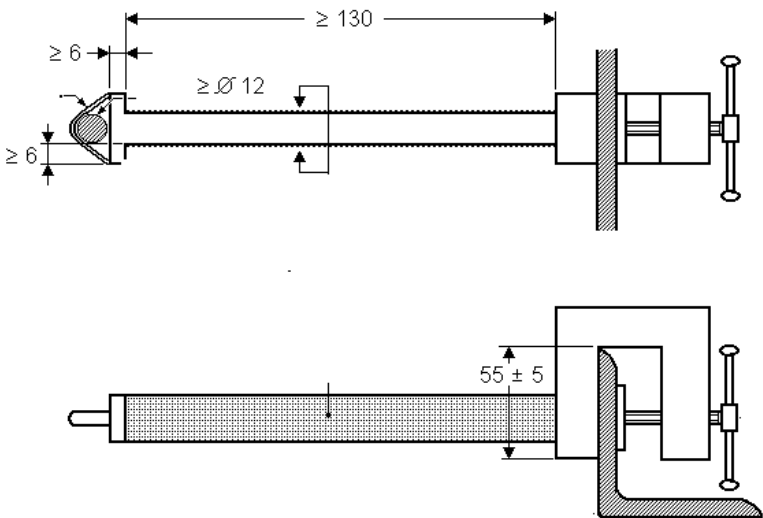
Seal & Signature of the Manufacturer



37. Guaranteed Technical Particulars (GTP) for Handling rung

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

1) Handling run

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Handling rung		
	The footboard, fixed to the corner of the upright of a trellis support, has the function of allowing the operator to climb or park, in sections of upright without trellis. This tool is used when climbing the lattice pylons, to create support points for the operator's feet.		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics	Dimension mm	
2.1			
2.1.1	principal Dimension	The main dimensions and tolerances are	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		shown in figure 2.1. The footpeg must be able to be fixed on angles of minimum dimensions in mm. between 60x60x4 and 250x250x24.	
2.2	Characteristic		
2.2.1	Material	made of stainless steel	
2.3	Min.Working Load	1,2 kN	
2.4	Max Weight	1,5 kg	
3.0	Characteristics for testing		
3.1	Coefficient of rupture (static)	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Document Requirements:

1	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



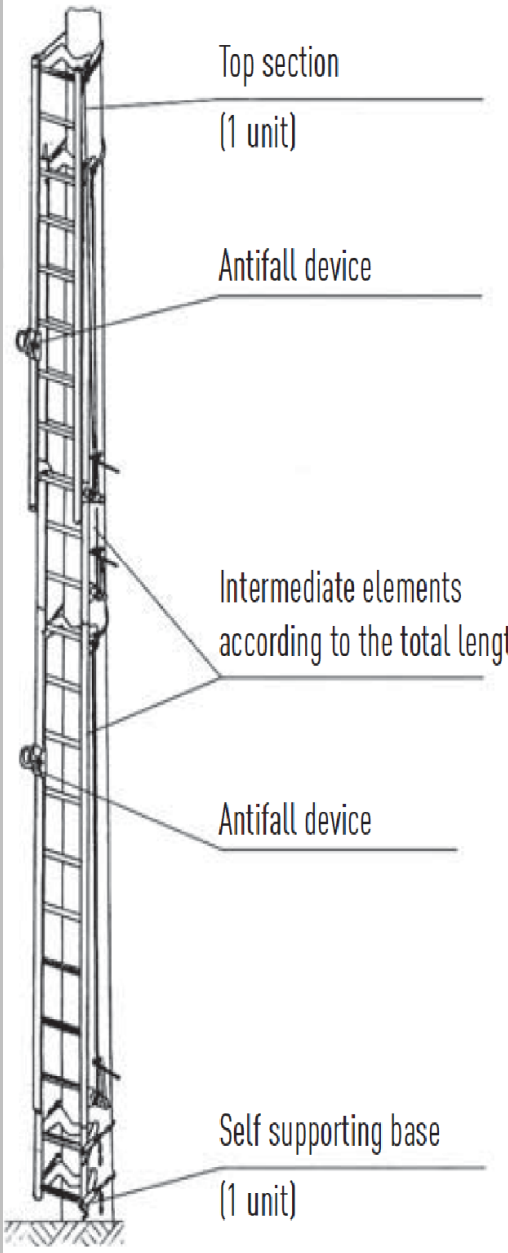
38. Guaranteed Technical Particulars (GTP) for Ladder for Tubes Pole

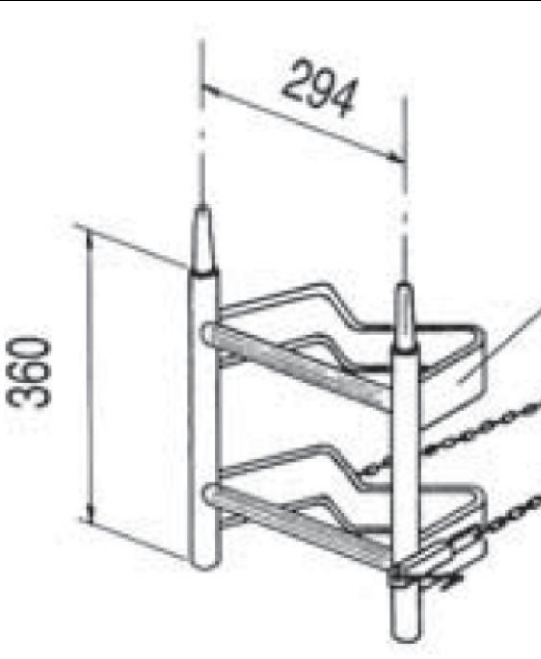
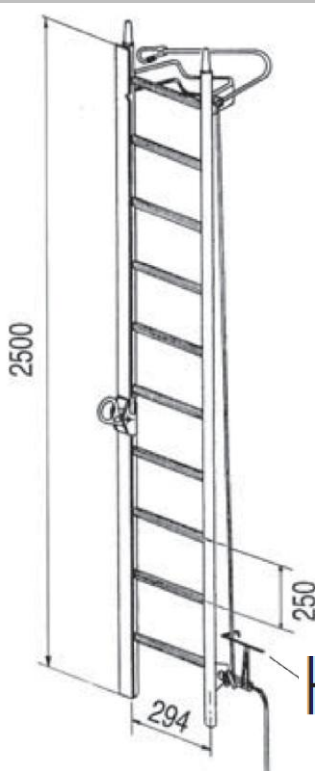
(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

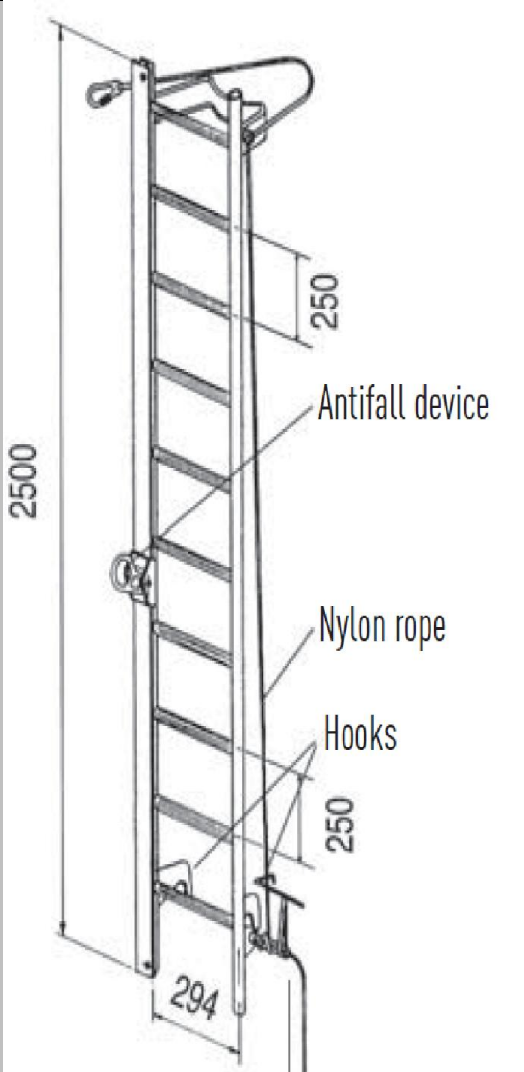
Ladder for tubes pole

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	<u>Ladder for tubes pole</u>		
	Suitable for climbing circular and polygonal poles. For quadrangular poles a special configuration is available upon request. A special attachment allows the operator to climb in safe conditions		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.3	Model designation	<i>Insert by bidder</i>	
1.4	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.5	Standard	EN 353/1 89/686/EEC	
1.6	Quality Control	ISO 9001 Certification	
1.7	Type of use	Outdoors, on pole towers	
1.10	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		



Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
	 The diagram illustrates a vertical self-supporting ladder. It consists of a top section (1 unit) at the top, followed by an antifall device. Below this are intermediate elements whose quantity is determined by the total length of the ladder. Another antifall device is located further down, and the entire structure is supported by a self-supporting base (1 unit) at the bottom. The ladder is shown with rungs and side rails.	The ladder must be composed of all the elements shown in the figure The supply must include 5 intermediate elements for each ladder	
2.1	SELF-SUPPORTING Base	Dimension mm	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.1		Dimension in figure :Tolerance ± 5 The base must be equipped with a safety chain for attachment to the pole	
2.1.1	Material	Aluminium alloy	
2.1.2	Working load min.	100 daN	
2.1.3	Weight max	6 kg	
2.2	Intermediate section	Dimension mm	
2.2.1		Dimension in figure :Tolerance ± 5 The intermediate part of the ladder must be equipped with a secure connection device to the pole, similar to shown in the figure The intermediate part of the ladder must be equipped with a anti – fall device (EN353/1) similar to shown in the figure 	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.2.2	material	Aluminium alloy	
2.2.3	Safety	Equipped with anti fall device EN 353/1	
2.2.4	Working load min.	100 daN	
2.2.5	Weight max	6,5 kg	
2.3	TOP SECTION		
2.3.1		Dimension in figure :Tolerance ± 5 The top section of the ladder must be equipped with a secure connection device to the pole, similar to shown in the figure The top section of the ladder must be equipped with a anti – fall device (EN353/1) similar to shown in the figure  It has to be built with two hooks that connect to the rungs of the intermediate ladder	
2.2.1	Material (excluding hooks)	aluminium	
2.2.2	Safety	Equipped with anti fall device EN 353/1	
2.2.3	Working load min.	100 daN	
2.2.4	Weight max	6,5 kg	
3.0	Characteristics for testing		

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Document Requirements:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

39. Guaranteed Technical Particulars (GTP) for Heavy-Duty Extendable Insulating Fiber Glass Ladder

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)



Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Description of the Item	Light Weight Multi-Section Sliding Type Extendable Heavy-Duty Insulating Fiber Glass Ladder	
2.	Manufacturer Name and address	To Be Mentioned	
3.	Type	Light Weight Sliding Type Extendable Heavy-Duty Insulating Fiber Glass Ladder	
4.	Model No.	To be mentioned	
5.	Country of Origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
6.	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
7.	Country of Shipment	To be mentioned	
8.	Size	Min 40 ft.	
9.	Number of Sections	2	
10.	Multi-Section	Yes	
11.	Approx. Product Length	Min. 20 ft	
12.	Max. Open Extended Length	Min 35 ft	
13.	Reach Height	Min. 36 ft	
14.	Safe Working Height	Min. 35 ft	
15.	Overall Width	Min. 18 inch	
16.	Material	Light Weight Fiberglass	
17.	Approx. Dimension LxWxH	To be mentioned	
18.	Weight	Max. 90 Pounds	
19.	Rails Dimension	3.30 inch	
20.	Steps/Rung Dimension	Min. 1.5 inch	
21.	Base Width	Min. 17-inch outside shoes	
22.	Fly Width	Min. 16 inch	
23.	Flange Dimension	Min. 1.19 inch	
24.	Rung Type	D-Rung/Triangular Rung	
25.	Fiber Glass Material Properties	Non-conductive when clean and dry	
26.	Number of Rungs (Section x Rungs)	2 x 20	
27.	Rung Material	Aluminium alloy with anti-slip coating.	
28.	Load Capacity	Min. 300 lb	
29.	Duty Rating Type	IA Duty Rating	
30.	Foot Design	A slip-resistant shoe with Shu-Lok & reg, feature, and spur plate	
31.	Foot Material	Slip-resistant pad	
32.	Pully & Rope	High-Quality heavy duty durable & repeated usable operating pulley & Rope	
33.	Color	To be mentioned	
34.	Standard	EN/ANSI/OSHA or Equivalent international standard	
35.	Warranty	Standard one year	



36.	Additional Feature:	1. Capable Works Around Electricity 2. Slip-resistant D-rungs/ Triangular Rung 3. Smooth operating pulley with rope 4. Interlocking side rails with internal rail guides on the bottom of the fly section securely connect rails. 5. Heavy-duty extruded rung locks are spring-loaded to operate smoothly. 6. Combination rail shield bracket and shoe with slip-resistant pad 7. Molded rung braces on the bottom step for increased durability. 8. Mar-resistant molded end caps	
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Document Requirements:

1.	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

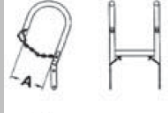
Seal & Signature of the Manufacturer

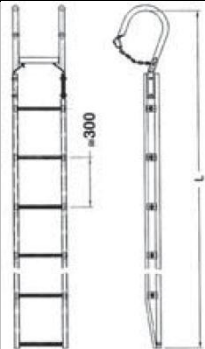


40. Guaranteed Technical Particulars (GTP) for Suspension Ladder for Work on Lattice Towers

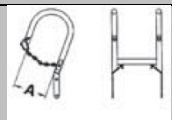
(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

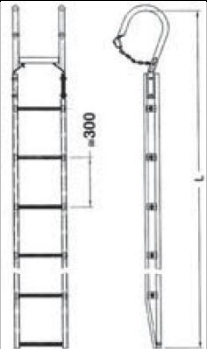
1) Suspension ladder mod 1

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Suspension Ladder		
		Light ladder suitable for vertical suspension on aerial line work – Tubular steel hook, complete with safety chain. It can be used contemporary by two operators.	
1.1	Manufacturer	<i>Insert by bidder</i>	
1.3	Model designation	<i>Insert by bidder</i>	
1.4	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.5	Standard	EN 353/1 89/686/EEC	
1.6	Quality Control	ISO 9001 Certification	
1.7	Type of use	Outdoors, on lattice towers	
1.10	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1	Suspension hooks		
2.1.1	Material	Corrosion-protected steel	
2.1.2	Safety	Equipped with hook closing chain	
2.1.3	Minimum hook opening dimensions (A)	220mm	
2.1.4	Minimum vertical working load	300 mm	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.2	Full Ladder		
2.2.1	Material (excluding hooks)	aluminium	
2.2.2	Step between the rungs	300 ± 10 mm	
2.2.3	Total length L	3000 ± 150 mm	
2.2.4	Maximum total weight	13 kg	
2.2.5	Width between stairwells	300 ± 10 mm	
2.2.7	Minimum vertical working load	300 daN	
2.2.8	Rungs	Anti slip	
2.2.9	Minimum single rung capacity	150 daN	
2.3	Anti-Fall device on stairwell mast		
2.3.1	Reference standard	EN 353/1	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

2) Suspension ladder mod 2

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Suspension Ladder		
		Light ladder suitable for vertical suspension on aerial line work - Tubular steel hook, complete with safety chain. It can be used contemporary by two operators.	
1.1	Manufacturer	<i>Insert by bidder</i>	
1.3	Model designation	<i>Insert by bidder</i>	
1.4	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.5	Standard	EN 353/1 89/686/EEC	
1.6	Quality Control	ISO 9001 Certification	
1.7	Type of use	Outdoors, on lattice towers	
1.10	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1	Suspension hooks		
2.1.1	Material	Corrosion-protected steel	
2.1.2	Safety	Equipped with hook closing chain	
2.1.3	Minimum hook opening dimensions (A)	220 mm	
2.1.4	Minimum vertical working load	300 mm	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.2	Full Ladder		
2.2.1	Material (excluding hooks)	aluminium	
2.2.2	Step between the rungs	300 ±10 mm	
2.2.3	Total length L	5000 ± 150 mm	
2.2.4	Maximum total weight	18 kg	
2.2.5	Width between stairwells	300 ±10 mm	
2.2.7	Minimum vertical working load	300 daN	
2.2.8	Rungs	Anti slip	
2.2.9	Minimum single rung capacity	150 daN	
2.3	Anti-Fall device on stairwell mast		
2.3.1	Reference standard	EN 353/1	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Document Requirements:

1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

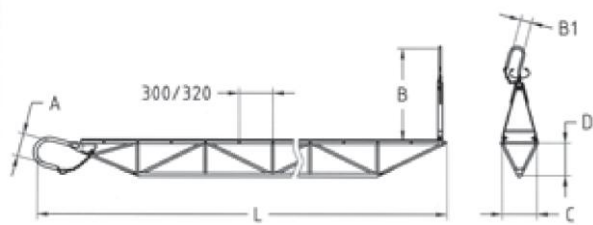
Seal & Signature of the Manufacturer

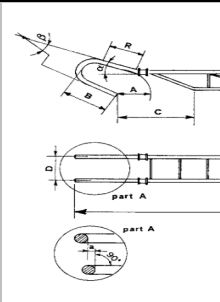


41. Guaranteed Technical Particulars (GTP) for Mooring Ladder for work on lattice towers.

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

a) Mooring ladder model 1

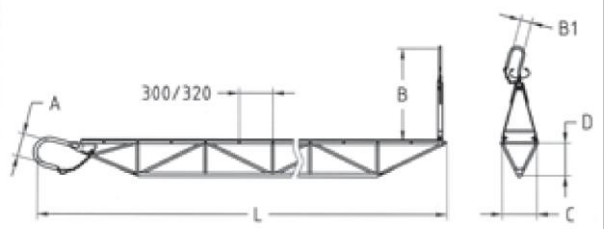
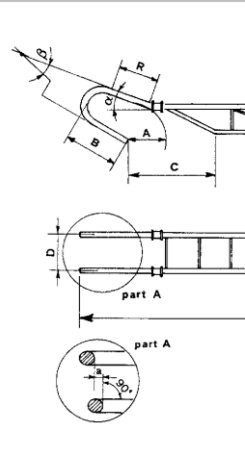
Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Mooring ladder		
		Designed to be used as a vertical suspension ladder or as a horizontal platform for overhead power line Operations. Anchored with special hooks at the tower arm and at the conductor. Made of aluminium alloy tubular structure with trapezoidal or triangular section in one piece or, on request, in two pieces for easier transport.	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	89/686/EEC	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors, on lattice towers	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
		Dimension mm Tolerance $\pm 10\%$	
2.1.1	Total length L	4000	
2.1.2	Minimum hook conductor opening dimensions (B1)	100	
2.1.4	C & D dimension	320	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.1.5	B dimension	900	
2.2	Hook for conductor		
2.2.1	Material	Corrosion-protected steel	
2.2.2	Safety	Equipped with hook closing chain	
2.2.3	Minimum vertical working load	300 daN	
2.3	Tower Hook	 Dimension mm	
2.3.1	hook opening dimensions (A)	300 ± 15	
2.3.2	R minimum	200	
2.3.3	B dimension	350 ± 15	
2.3.4	Safety	Equipped with hook closing chain	
2.4	Full Mooring Ladder		
2.4.1	Material (excluding hooks)	aluminium	
2.4.3	Minimum Horizontal working load	150 daN	
2.2.3	Vertical working load	300 daN	
2.2.4	Maximum total weight	19 kg	
2.2.5	step between rungs of ladder	300 ± 30 mm	
2.2.8	Rungs	Anti slip	
2.2.9	Minimum single rung capacity	150 daN	
3.0	Characteristics for testing		

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

b) Mooring ladder Model 2

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Mooring ladder		
		Designed to be used as a vertical suspension ladder or as a horizontal platform for overhead power line Operations. Anchored with special hooks at the tower arm and at the conductor. Made of aluminium alloy tubular structure with trapezoidal or triangular section in one piece or, on request, in two pieces for easier transport.	
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	89/686/EEC	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors, on lattice towers	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1			
2.1		Dimension mm Tolerance $\pm 10\%$	
2.1.1	Total length L	6000	
2.1.2	Minimum hook conductor opening dimensions (B1)	100	
2.1.4	C & D dimension	320	
2.1.5	B dimension	900	
2.2	Hook for conductor		
2.2.1	Material	Corrosion-protected steel	
2.2.2	Safety	Equipped with hook closing chain	
2.2.3	Minimum vertical working load	300 daN	
2.3	Tower Hook	 Dimension mm	
2.3.1	hook opening dimensions (A)	300 ± 5	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.3.2	R minimum	200	
2.3.3	B dimension	350 ±5	
2.3.4	Safety	Equipped with hook closing chain	
2.4	Full Mooring Ladder		
2.4.1	Material (excluding hooks)	aluminium	
2.4.3	Minimum Horizontal working load	150 daN	
2.2.3	Minimum Vertical working load	300 daN	
2.2.4	Maximum total weight	29 kg	
2.2.5	step between rungs of ladder	300 ±10 mm	
2.2.8	Rungs	Anti slip	
2.2.9	Minimum single rung capacity	150 daN	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Document Requirements:

1.	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

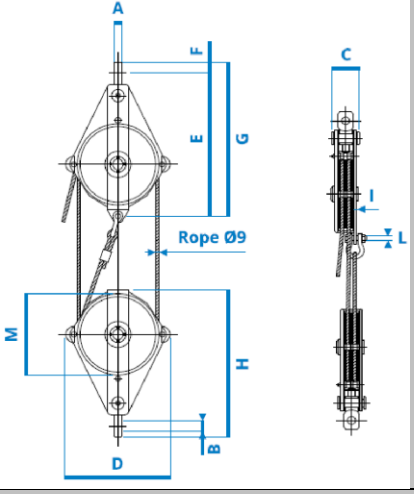
Seal & Signature of the Manufacturer

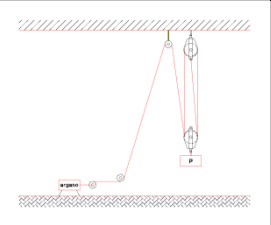


42. Guaranteed Technical Particulars (GTP) for TACKLE BLOCKS

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

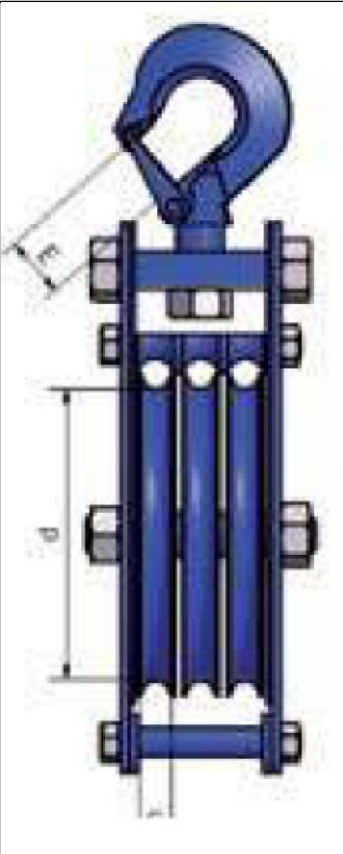
a) Tackle blocks type 1 (steel ropes)

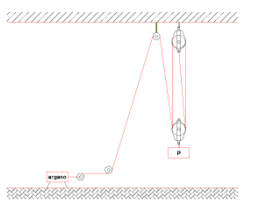
Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Tackle blocks		
	Lifting/pulling Tackles with steel sheaves mounted on ball bearings, galvanized steel frame, suitable for 9mm steel wire (included)		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
		Dimension mm	
2.1.1	Dimension (A)	22 ± 2	
2.1.2	Dimension (B)	20 ± 2	
2.1.3	Dimension (C)	65 ± 3	
2.1.4	Dimension (D)	245 ± 3	
2.1.5	Dimension (E)	330 ± 3	
2.1.6	Dimension (F)	20 ± 2	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.1.7	Dimension (G)	350 ± 3	
2.1.8	Dimension (H)	330 ± 3	
2.1.9	Dimension (I)	$8 \pm 0,5$	
2.1.10	Dimension (L)	10 ± 1	
2.1.11	Dimension (M)	180 ± 3	
2.1.12	Min.Working Load	30 kN	
2.1.13	Max Weight	20 kg	
2.1.14	Pulling force	1:4	
2.2	test example		
2.2.1	Material of Chassis	Corrosion-protected steel	
2.3	Wheel	Corrosion-protected steel	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

b) Tackle blocks type 2 (synthetic rope)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Tackle blocks (synthetic rope)		
	The Tackle blocks for fiber rope is a tool suitable for exercising a pull with a theoretical ratio between resistance and power equal to the number of wheels involved; It consists of two groups of pulleys		

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	Directive 2006/42/EC of the European Parliament	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1		Dimension mm	
2.1.1	Dimension (d)	70 ± 5	
2.1.2	Dimension (E)	28 ± 2	
2.1.3	Dimension rope	16	
2.1.12	Min.Working Load	5 kN	
2.1.13	Max mass per pair of blocks	5kg	
2.1.14	Pulling force	1:6	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.2	test example		
2.2.1	Material of Chassis	Corrosion-protected steel	
2.3	Wheel	Corrosion-protected steel or Synthetic	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Document Requirements:

1	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

43. Guaranteed Technical Particulars (GTP) for Hydraulic Hand Operated ACSR Conductor Cutter

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Description of the Item	Self-Contained Hydraulic Hand Operated ACSR Conductor, EHS Guys Wire & Bolt Cutter	
2.	Manufacturer Name and address	To Be Mentioned	
3.	Type	Self-Contained Hydraulic Hand Operated Type	
4.	Model No.	To be mentioned	
5.	Country of origin	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
6.	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/South Korea/Brazil/Mexico/South Africa	
7.	Country of Shipment	To be mentioned	
8.	Cutting Material Range		
	ACSR Conductor	Min 1113 kcmil	
	Standard Guy Strand	Min 1/2" (13 mm)	
	EHS Guy Stands	Min 3/8" (10 mm)	
	Copper & Aluminium Cable	Min 1.29 " (OD)/ (33 mm)	
	Soft Steel Bolts	Min 5/8" (16 mm)	
	Ground Rod	Min 5/8" (16 mm)	
	Rebar	Min 1/2" (13 mm)	
9.	Cutting Force	Min. 10 Tons	
10.	Head Rotation	180 Degree	
11.	Material	Standard Tool Steel/Alloy	
12.	Dimensions	To be mentioned	
13.	Two-stage pumping/Rapid Pump	Yes	
14.	Specialized Latch Head Design	Yes	
15.	Handle Trigger Drain	Yes	
16.	Precision cutting Blades	Yes	
17.	Ergonomic Handle Design	Yes	
18.	Comfort Grip Handle	Yes	
19.	Weight	Max. 20 lbs.	
20.	Standard	OSHA/ASTM/ANSI/ASME/ROHS/JIS/IEC/DN or Equivalent	
21.	Warranty	Standard one year	
22.	Additional Feature:	1. Two-Stage pumping/ Rapid Pump 2. The cutter will make a straight, clean cut every time. 3. The head opens easily for inserting cable at any location along the line.	
23.	Package (Set) Include	1 x Hydraulic Cutter + 1 x Carrying Case + 1 Set Spare Blades- Fixed + Moving (If necessary)	



Document Requirements:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

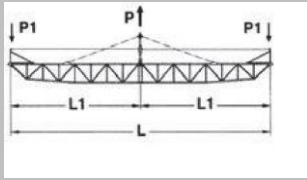
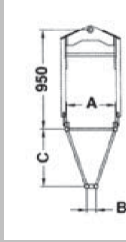
Seal & Signature of the Manufacturer

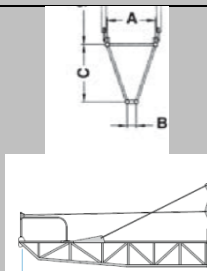
44. Guaranteed Technical Particulars (GTP) for Crossbar for Mooring (Working Platform)

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

a) Crossbar for Mooring ladder Model 1

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Crossbar for Mooring (Working Platform)		
	The crossbar (platform) is a tool suitable to support operators in the vicinity of the elements object of the intervention. It shall be suspended in the center on a fixed support and maintained in the horizontal working position with stays or other suitable devices suitably anchored. The components that make up the crossbar are described below. <u>1) Sectional log platform</u> The platform is composed of terminal section and intermediate section with a reticular structure of isosceles trapezoidal section. <u>2) Suspension element.</u> Organ that allows to suspend the beam, to the structure of the support of the line where it operates, by means of connecting elements such as metal bridles and shackles. <u>3) Tie rods</u> Support elements of the system equipped with tensioner to adjust the positioning of the beam with respect to the suspension element. <u>4) Barrier</u> Element that develops along one side of the beam to which the user is secured by means of a lanyard equipped with an energy dissipator with which the safety harness is equipped.		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	89/686/EEC ISO EN 795	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	

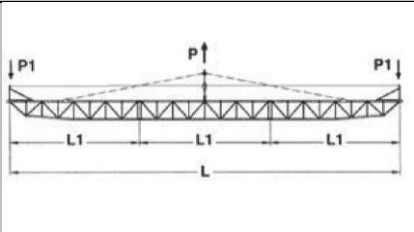
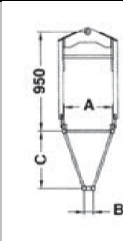
Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.7	Service conditions: Ambient air temperature	-5 to +40	
2.	Characteristics		
2.1		Dimension mm Tolerance $\pm 10\%$	
2.1.1	Total length L	8000	
2.1.2	Section Length (L1)	4000	
2.1.4	Minimum vertical load at the two ends (P1)	300 daN	
2.1.5	Minimum vertical load Suspension element (P)	600 daN	
2.1.6	Maximum total weight	90 kg	
2.2	Characteristic & Dimension Suspension element		
2.2.1	Material Suspension element	Corrosion-protected steel	
2.2.2			
2.2.3	Equipment suspension element	The suspension element must be equipped with: 1) an upper attachment to suspend the Platform to the tower; 2) four connections for connecting the tie rods; 3) attachments for the barrier rope; 4) two hinges for connection with the beam; 5) sleepers to allow the operator easy	

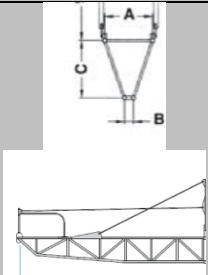
Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		access to the beam	
2.3	Dimension platform (section) mm		
2.3.1	Dimension (A)	350 ±20	
2.3.2	Dimension (C)	450 ±20	
2.3.3	Dimension (B)	85 ±5	
2.3.4	Minimum vertical load	600 daN	
2.5	Anti fall barrier		
2.5.1	Characteristic	The barrier must develop along one side of the platform and have a height from the upper currents of this, of about 50 cm. It consists of: -one or two straight metal bridles, complete with screw tensioners and fixed to the suspension element and to the two supports; -two supports to be mounted at the ends of the beam and foldable on it for easy transport. The barrier shall be capable of withstanding the dynamic stress caused by a mass falling from a height of 1,50 m.	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
2.3.2	Standard	ISO EN 795	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

b) Crossbar for Mooring ladder Model 2

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Crossbar for Mooring (Working Platform)		
	The crossbar (platform) is a tool suitable to support operators in the vicinity of the elements object of the intervention. It shall be suspended in the centre on a fixed support and maintained in the horizontal working position with stays or other suitable devices suitably anchored. The components that make up the crossbar are described below. <u>1) Sectional log platform</u> The platform is composed of terminal section and intermediate section with a reticular structure of isosceles trapezoidal section. <u>2) Suspension element</u> Organ that allows to suspend the beam, to the structure of the support of the line where it operates, by means of connecting elements such as metal bridles and shackles. <u>3) Tie rods</u> Support elements of the system equipped with tensioner to adjust the positioning of the beam with respect to the suspension element. <u>4) Barrier</u> Element that develops along one side of the beam to which the user is secured by means of		

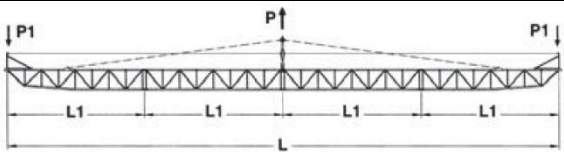
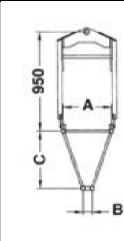
Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
	a lanyard equipped with an energy dissipator with which the safety harness is equipped.		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	89/686/EEC ISO EN 795	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
2.1			
		Dimension mm Tolerance $\pm 10\%$	
2.1.1	Total length L	12000	
2.1.2	Section Length (L1)	4000	
2.1.4	Minimum vertical load at the two ends (P1)	300 daN	
2.1.5	Minimum vertical load Suspension element (P)	600 daN	
2.1.6	Maximum total weight	120 kg	
2.2	Characteristic & Dimension Suspension element		
2.2.1	Material Suspension element	Corrosion-protected steel	
2.2.2			
2.2.3	Equipment suspension element	The suspension element must be equipped with: 1) an upper attachment to suspend the Platform to	

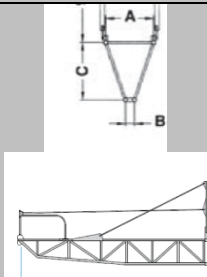
Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		the tower; 2) four connections for connecting the tie rods; 3) attachments for the barrier rope; 4) two hinges for connection with the beam; 5) sleepers to allow the operator easy access to the beam	
2.3	Dimension platform (section) mm		
2.3.1	Dimension (A)	350 ±20	
2.3.2	Dimension (C)	450 ±20	
2.3.3	Dimension (B)	85 ±5	
2.3.4	Minimum vertical load	600 daN	
2.5	Anti fall barrier		
2.5.1	Characteristic	The barrier must develop along one side of the platform and have a height from the upper currents of this, of about 50 cm. It consists of: -one or two straight metal bridles, complete with screw tensioners and fixed to the suspension element and to the two supports; -two supports to be mounted at the ends of the beam and foldable on it for easy transport. The barrier shall be capable of withstanding the dynamic stress	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		caused by a mass falling from a height of 1,50 m.	
2.3.2	Standard	ISO EN 795	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

c) Crossbar for Mooring ladder Model 3

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Crossbar for Mooring (Working Platform)		
	The crossbar (platform) is a tool suitable to support operators in the vicinity of the elements object of the intervention. It shall be suspended in the centre on a fixed support and maintained in the horizontal working position with stays or other suitable devices suitably anchored. The components that make up the crossbar are described below. <u>1) Sectional log platform</u> The platform is composed of terminal section and intermediate section with a reticular structure of isosceles trapezoidal section. <u>2) Suspension element</u> Organ that allows to suspend the beam, to the structure of the support of the line where it operates, by means of connecting elements such as metal bridles and shackles. <u>3) Tie rods</u> Support elements of the system equipped with tensioner to adjust the positioning of the beam with		

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
	respect to the suspension element. \$)Barrier Element that develops along one side of the beam to which the user is secured by means of a lanyard equipped with an energy dissipator with which the safety harness is equipped.		
1.1	Manufacturer	<i>Insert by bidder</i>	
1.2	Model designation	<i>Insert by bidder</i>	
1.3	Country of origin & Manufacturer	EU/UK/USA/Japan	
1.4	Standard	89/686/EEC ISO EN 795	
1.5	Quality Control	ISO 9001 Certification	
1.6	Type of use	Outdoors,	
1.7	Service conditions: Ambient air temperature	-5 to +40 °C	
2.	Characteristics		
		Dimension mm Tolerance $\pm 10\%$	
2.1.1	Total length L	16000	
2.1.2	Section Length (L1)	4000	
2.1.4	Minimum vertical load at the two ends (P1)	300 daN	
2.1.5	Minimum vertical load Suspension element (P)	600 daN	
2.1.6	Maximum total weight	150 kg	
2.2	Characteristic & Dimension Suspension		
2.2.1	Material Suspension element	Corrosion-protected steel	
2.2.2			
2.2.3	Equipment suspension element	The suspension element must be equipped with:	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		1) an upper attachment to suspend the Platform to the tower; 2) four connections for connecting the tie rods; 3) attachments for the barrier rope; 4) two hinges for connection with the beam; 5) sleepers to allow the operator easy access to the beam	
2.3	Dimension platform (section) mm		
2.3.1	Dimension (A)	350 ±20	
2.3.2	Dimension (C)	450 ±20	
2.3.3	Dimension (B)	85 ±5	
2.3.4	Minimum vertical load	600 daN	
2.5	Anti fall barrier		
2.5.1	Characteristic	The barrier must develop along one side of the platform and have a height from the upper currents of this, of about 50 cm. It consists of: -one or two straight metal bridles, complete with screw tensioners and fixed to the suspension element and to the two supports;	

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
		-two supports to be mounted at the ends of the beam and foldable on it for easy transport. The barrier shall be capable of withstanding the dynamic stress caused by a mass falling from a height of 1,50 m.	
2.3.2	Standard	ISO EN 795	
3.0	Characteristics for testing		
3.1	Coefficient of rupture	3	
3.2	Welding	Tig System	
3.3	List and results of type tests	<i>Insert by bidder</i>	
4.0	General compliance with requirements (yes/no)	Yes/No.	

Document Requirements:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



45. Guaranteed Technical Particulars (GTP) for Manual Lever Chain Hoist (6 Ton)

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Description of the Item	Lightweight, compact and rugged construction Heavy Duty Lever Chain Hoist.	
1	Manufacturer's Name & Address	To be mentioned	
3	Type	Lightweight, compact and rugged construction Heavy Duty Lever Chain Hoist.	
4	Model No.	To be mentioned	
5	Country of origin	USA/Europe/Canada/Japan/Australia/Korea/Brazil/Mexico/South Africa	
6	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/Korea/Brazil/Mexico/South Africa	
7	Country of Shipment	To be mentioned	
8	Lifting Capacity	6 Ton	
9	Minimum Lifting Height	3 Meter	
10	Length of Handle	Min. 360 mm (14.17")	
11	Load Chain Diameter	10 mm	
12	Strand of load chain / No. of Falls of Load Chain (Min.)	2	
13	Chain Stripper	Yes	
14	Type of Hoist	Ratchet and pawl	
15	Braking System	Dual Brake system	
16	Materials:		
16.1	Body	Alloy Steel	
16.2	Hook	Stainless steel load chain or spark resistance hooks	
16.3	Load Chain	Premium Grade Alloy steel or Stainless Steel	
16.4	Handle	Alloy Steel	
17	Hook Type	Self-Locking (Safety) hook	
18	Material Finish	High quality powder coat paint offering excellent corrosion protection.	
19	Material		
20	Operating Temperature	-40°C ~ +80°C	
21	Weight	To be mentioned	
22	Standard	AS 1418.2, BS EN 13157:2004+A1: 2009, ANSI/ASME B30.21 and SANS 1636	
23	Warranty	Standard one Year	
24	Additional Feature:	Slipping clutch overload protection. Light load tested and certified at 2% of the rated capacity. Adaptable to use both inverted and horizontally.	



Document Requirements:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

46. Guaranteed Technical Particulars (GTP) for Battery Load Test Set

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

1. General Description:

This technical specification is to describe the technical characteristics of the battery test set designed for the test of battery benches using the discharge method. This testing device can discharge the battery in different Models, to measure the capacity of new and used battery.

2. Technical Requirements:

The instrument should be suitable for performing to test a battery bank at constant current, constant power, constant resistance or using a user-defined load profile. The instrument must include monitoring of cell voltages and battery blocks in battery banks commonly found in electrical power sub-stations, telecom facilities and computer data center UPS systems.

3. General Requirements:

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
3.1	Manufacturer Name	To be mentioned	
3.2	Manufacturer Address	To be mentioned	
3.3	County of Origin	USA/UK/EU/Italy	
3.4	Country of Manufacturer	USA/UK/EU/Italy	
3.5	Country of Shipment	To be mentioned	
3.6	Type & Model	To be mentioned	
3.7	Hardware Version	To be mentioned	
3.8	Software Version	To be mentioned	
3.9	Language on Display & Software	English	

4. Measurement

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
4.1	Current Measurement		
4.1.1	Display Range	0-1000.0 A	
4.1.2	Resolution	0.1 A	
4.1.3	Accuracy (near)	± 0.5%	
4.1.4	Internal Current Measurement (Min.)/Discharge current	0-200 A	
4.1.5	Current Measurement Refresh Period	30 second	
4.2	Input for Clamp-on Probe		
4.2.1	Range	0 to 1000 mV DC	
4.2.2	mV/A ratio	software settable, 0.3 to 100mV/A	



4.2.2	Input Impedance	>1MΩ	
4.3	Voltage Measurement		
4.3.1	Display Range	0 to 250 V	
4.3.2	Accuracy	±0.5% or better	
4.3.3	Resolution	0.1V	
4.3.4	Voltage Range (min.)	0-300V DC	
4.4	Time Measurement		
4.4.1	Accuracy	±0.1% of reading	
4.4.2	Time Measurement Refresh Period	1 Second	
4.5	Constant R	Range: 300 mΩ to 3 kΩ Inaccuracy: +/- 1 % Resolution: 100 mΩ	
4.6	Constant P (max.)	Range: 0 to 20 KW Inaccuracy: +/- 1 % Resolution: 10W	

5. Power Supply & Hardware:

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
5.1	Main Supply Voltage	100-240V AC, 50Hz	
5.2	Power Consumption	200 watt (max)	
5.3	Power Interruption	30 ms (max)	
5.4	Dimension	To be mentioned	
5.5	Weight	To be mentioned	

6. Loading Capabilities:

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
6.1	Load Pattern	Constant current, constant power, constant resistance, current or power profile with dynamic discharge feature using switch technology and generate smooth curve throughout with constant power injection	
6.2	Battery Voltage (DC)	20V to 300V	
6.3	Minimum Discharge Current Capacity (DC)	0 to 200A	
6.4	Power (max.)	0 to 20 KW	



6.5	Resistance Setting range	0.3Ω to 3KΩ	
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7. Battery Extra Load Unit

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
7.1	1 x resistive extra loading unit	To be provides higher load currents for use in constant current or constant power test. The loading unit should satisfy the following requirements	
7.2	Controllable by main unit	Yes	
7.3	Supply voltage:	100-240V AC, 50Hz	
7.4	Loading Voltage (DC) max	110V to 230V	
7.5	Loading Current (min.)	110A for 110V 55A For 220V	
7.6	Loading Power (Max)	0~25 KW	
7.7	Protection	Thermal Cut-outs, Automatic Overload	
7.8	Weight & Dimension	To be mentioned	

8. Operating Standard, Safety & Environment:

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
8.1	Operating Temperature	0°C to +50°C	
8.2	Storage & transportation Temperature	0°C to +50°C	
8.3	Relative Humidity	Up to 90%	
8.4	Operating & Storage Altitude	Less than 750 meter	
8.5	Vibration	Instrument only ETSI EN 300 019-2-7 class 7M2 Instrument in transport case ISTA 2A	
8.6	Shock		
8.7	CE-marking	LVD 2014\35\EU EMC 2014\30\EU RHS 2011\65\EU	
8.8	3rd Party safety & Evolution certificate	To be mentioned	
8.9	Air flow detection	Indication if any air flow is blocked while using the kit	
8.10	Protection	Thermal Cut-outs, Automatic Overload, Emergency Stop	



		Button	
8.11	Alarm	Yes	



9. Benefit & Features

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
9.1	Expandable for large battery banks using extra loading units	Yes	
9.2	Output for controlling Extra Load unit	Yes	
9.3	Built in Display with Graphical & curve representation during test	7-inch LCD, Capacitive touch screen	
9.4	PC Communication & controlling equipment	To be mentioned	
9.5	Battery Cell voltage Monitoring	Must be included	
9.6	Input for sensing voltage at Battery Terminal	Yes	

10. Test Result & Software

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
10.1	View real time test result	Yes	
10.2	Number of test files saved in memory	10	
10.3	Maximum test duration recorded in memory	12 hours	
10.4	Software	At least Windows 7 Compatible. Also, must be compatible with the latest version of the OS.	
10.5	Software Interface	To be mentioned	

11. Hardware Accessories, Documentation & Calibration:

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
11.1	Hardware Accessories	To perform a complete test including Extra Load Unit, all necessary accessories with transportation case must be supplied.	
11.2	Documentation	Printed user manual must be supplied.	
11.3	Factory calibration certificate	Yes	
11.4	Warranty Period	Standard one year	
11.5	Customer Support	Yes	

11.6	Field Demonstration	Yes	
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Documentation Requirements:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



47. Guaranteed Technical Particulars (GTP) for Digital Clamp Meter Test Set / AC and DC CLAMP Meter

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Description of the Item	Supplying of brand new, light weight, rugged & robust Digital Clamp Meter having high accuracy and high quality without disturbance in high electromagnetic field.	
2.	Name of the Manufacturer	To be mentioned	
3.	Address of the manufacturer	To be mentioned	
4.	Type	To be mentioned	
5.	Model number	To be mentioned	
6.	Country of origin	USA/UK/EU/Canada/Switzerland/Australia/Japan	
7.	Country of Manufacturer	USA/UK/EU/Canada/Switzerland/Australia/Japan	
8.	Construction	Digital, Light weight, Pocket sized, rugged, robust.	
9.	AC Current	Range: 6.0mA/ 60.00 mA / 600.00 mA / 6.000 A / 60.00 A ; Resolution: 0.001mA/ 0.01 mA / 0.10 mA / 0.001 A / 0.01 A Accuracy: 1%/2%/10% , ± 10 digits	
10.	Frequency	Range: To be mentioned Resolution: To be mentioned Accuracy: To be mentioned	
11.	CAT Rating	CAT III 1000 V / CAT IV 600 V / CATIII 600 V	
12.	Backlight	Yes	
13.	Auto Shutoff	Yes	
14.	AC Response	True RMS	
15.	Data hold option	Yes	
16.	Battery Life	> 40 Hours	
17.	Jaw opening	< 40mm	
18.	Dimension	To be mentioned	
19.	Weight	To be mentioned	
20.	Operating Temperature	0°C – 50°C	
21.	Storage Temp	0°C – 60°C	
22.	Warranty	Standard one year	
23.	Safety Conformity	IEC 61010-1, Pollution Degree 2 or equivalent	
24.	Calibration Certificate	To be Provided	
25.	Manufacturer Authorization Letter	To be provided	
26.	Accessories to be supplied	Standard Accessories to be supplied	

Documentation Requirements:

1.	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.



2.	Document to be supplied during supply	• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
		• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



48. Guaranteed Technical Particulars (GTP) for TOWER HARNESS WITH ABSORBING LANYARDS

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no .	Description	Required Specification	Bidder's Guaranteed Particulars
1	Description of the Item	Full Body Harness For work positioning belt for climbing and suspension applications.	
2	Manufacturer Name and address	To Be Mentioned	
3	Type	Full Body Harness with Twin Lanyard	
4	Model No	To be mentioned	
5	Country of origin	USA/Europe/Canada/Japan/Australia/Korea/Brazil/Mexico/South Africa	
6	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/Korea/Brazil/Mexico/South Africa	
7	Country of Shipment	To be mentioned	
Full Body Harness			
8	Man Size (Chest)	34" - 42"	
9	Man Size (Height)	5'4" - 6'0"	
10	Body Belt Size (W)	Min. 45 mm or suitable	
11	Thigh Belt Shape	V Shaped with Quick Fastening Buckle	
12	Thigh Belt Size (W)	Min. 45 mm or suitable	
13	Waist Belt	Yes with Quick Fastening	
14	Waist Belt Size (W)	Min. 45 mm or suitable	
15	Chest Belt (W)	Min. 25mm or suitable	
17	Thigh Pad (Included)	Yes (For Both Thigh)	
18	Shoulder Pad (Included)	Yes (For Both Shoulder)	
19	Hook Hanger No (Included)	Min. 2 Pieces	
Twin Lanyard			
20	Lanyard Type	Elastic Strap Type Twin Lanyard & Lightweight	
21	Dimension Length of Lanyard	Min. 25mm (W) x 1500mm(L)	
22	Elastic Strap Shrink Length while not using	1100-1200mm	
23	Energy Absorber No (Included)	Min. 1 Pieces	
24	Snap Hook No	2 Pieces	
25	Effective Opening of Snap Hook	Min. 50 mm	



Sl. no .	Description	Required Specification	Bidder's Guaranteed Particulars
26	Material of Body of Snap Hook	Forged Steel/ Chrome Vanadium/ Carbon Steel	
27	Material of Catches of Snap Hook	Forged Steel/ Chrome Vanadium/ Carbon Steel/ Aluminium Alloy	
28	Load Capacity of Nylon Material	Min. 6,500 lb. test woven nylon web	
29	Weight	Max. 2.70 Kg	
30	Standard	ANSI/ASTM/EN/CE/ OSHA or Equivalent	
31	Warranty	Standard one Year	
32	Accessories	1. Keeping Bag (if possible) 2. Catalog and Other necessary accessories.	
33	Additional Features	1. Webbing is in contrasting colors 2. Thigh Pad should be an easy attachment. 3. Soft and lightweight.	
34	Package (Set) included	1x Full Body Harness + 1 x Elastic Strap Type Twin Lanyard (Set) + Other necessary accessories	

Documentation Requirements:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

49. Guaranteed Technical Particulars (GTP) for QUAD BOX RATCHETING WRENCH

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no .	Description	Required Specification	Bidder's Guaranteed Particulars
1	Description of the Item	Quad box Ratcheting wrench with reversible thumb lever to change direction for Multi-	



		size	
2	Manufacturer Name and address	To Be Mentioned	
3	Type	Quad box ratcheting wrench for multi size	
4	Model No.	To be mentioned	
5	Country of origin	USA/Europe/Canada/Japan/Australia/South Korea/ Brazil/Mexico/South Africa	
6	Country of Manufacturing	USA/Europe/Canada/Japan/Australia/South Korea/ Brazil/Mexico/South Africa	
7	Country of Shipment	To be mentioned	
8	Head Style	Hex / Dodecagon	
9	Pump Type	Mechanical	
10	Total Number of Sizes	4 Nos	
11	Sizes	19 mm x 21 mm x 22 mm x 24 mm	
12	Handle Design	Standard	
13	Measurement System	Matric	
14	Material	Chrome molybdenum steel/ Standard Alloy Steel/ SUS420J2	
15	Dimensions	To be mentioned	
16	Finish	Nickle/Phosphate Chrome Polished	
17	Color	Silver	
18	Socket Weight	Max. 1 lb.	
19	One Hand Operation	Yes	
20	Standard	OSHA /ASTM/ANSI/ASME/Any International Certification	
21	Warranty	Standard one Year	
22	Additional Features:	1. Just slip the wrench over to access the other two sizes. ratcheting box end wrench eliminates the need for a traditional ratchet and socket combination. 2. Four dedicated recessed reversing levers for ease of use and change of direction. 3. Surface Drive on box end provides off-corner loading for better grip and reduced fastener rounding, made with precision and quality in mind	
23	Package (Set) Included	1 x Quad box ratcheting wrench	

Document Requirements:

1	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate



Seal & Signature of the
Bidder/Tenderer

Seal & Signature of the Manufacturer



50. Guaranteed Technical Particulars (GTP) for INSULATION OIL MOISTURE ANALYZER TEST SET

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Description of the Item	Oil Moisture Analyzer Test Set	
2	Name of the Manufacturer	To be mentioned	
3	Address of the manufacturer	To be mentioned	
4	Type	To be mentioned	
5	Model number	To be mentioned	
6	Country of origin	USA/UK/EU/Canada /Switzerland/Australia/Japan	
7	Country of made	USA/UK/EU/Canada /Switzerland/Australia/Japan	
8	Country of Shipment	To be mentioned	
9	Standards	IEC/IEEE/CIGRE/ANSI	
10	Power Supply		
	Mains input	200 – 250 V AC, 50 Hz,	
	Supply type	1 Phase supply	
11	Moisture Analysis		
	Titration method	Karl Fischer Titration	
	Titration Speed	Min. 1.5mg per minute	
	Max. current during test	Less than 500mA	
	Moisture content unit	ppm	
	Accuracy	± 0.5%	
	Data logging	USB / RS232	
	Internal Data Storage	Minimum 100 records.	
12	Carry Case	Yes	
13	Battery Life	6 hours continuous operation Minimum	
14	Display	Backlit display.	
15	Printer	Thermal printer	
16	Dimension	To be mentioned	
17	Weight	To be mentioned	
18	Environment & Others		
19	Operating temperature	10 °C to 50 °C	
20	Humidity	20% - 85% RH	
21	Standard followed for safety and EMC conformity	To be mentioned	
22	All necessary accessories	To be mentioned	

Document Requirements:

1	Certificates to be supplied with the tender document	- Manufacturer's EMC Certificate of Conformity - Manufacturer's valid ISO Certificate.
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		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
		● Country of origin Certificate
2 .	Document to be supplied during supply	● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the
Bidder/Tenderer

Seal & Signature of the Manufacturer



51. Guaranteed Technical Particulars (GTP) for OIL INTERFACIAL TENSION TEST SET

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Description of the Item	Measurement of insulation oil interfacial tension.	
2.	Name of the Manufacturer	To be mentioned	
3.	Address of the manufacturer	To be mentioned	
4.	Type	To be mentioned	
5.	Model number	To be mentioned	
6.	Country of origin	USA/UK/EU/Canada /Switzerland/Australia/Japan	
7.	Country of made	USA/UK/EU/Canada /Switzerland/Australia/Japan	
8.	Country of Shipment	To be mentioned	
9.	Standards	IEC/IEEE/CIGRE/ANSI	
10.	Interfacial Tension Measurement	Measuring range: 1 – 999 mN/m Resolution: 0.01 mN/m	
11.	Density Measurement	Measuring range: 1 – 2000 kg/m ³	
12.	Maximum Load	5 g	
13.	Calibration (Auto/Manual)	To be mentioned	
14.	Display	Backlit display	
15.	Printing Facility	To be mentioned	
16.	Dimension	To be mentioned	
17.	Weight	To be mentioned	
18.	Environment & Others		
	Operating temperature	10 °C to 50 °C	
	Humidity	80% RH	
	Standard followed for safety and EMC conformity	To be mentioned	
	All necessary accessories	To be mentioned	

Document Requirements:

1	Certificates to be supplied	Manufacturer's EMC Certificate of Conformity
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.	with the tender document	• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



52. Guaranteed Technical Particulars (GTP) for OIL ACIDITY TEST SET

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
10.	Description of the Item	Titrator for performing Total Acidity Number (TAN) analysis by Potentiometric Titration with following specifications: a) Separate magnetic stirrer has to be supplied. b) Real time curve display on screen.	
11.	Name of the Manufacturer	To be mentioned	
12.	Address of the manufacturer	To be mentioned	
13.	Type	To be mentioned	
14.	Model number	To be mentioned	
15.	Country of origin	USA/UK/EU/Canada /Switzerland/Australia/Japan	
16.	Country of made	USA/UK/EU/Canada /Switzerland/Australia/Japan	
17.	Country of Shipment	To be mentioned	
18.	Standards	IEC/IEEE/CIGRE/ANSI	
10.	Power Supply		
	Main input	100 – 250 V AC, 50 Hz	
	Supply type	1 Phase supply	
11.	Technical Specifications		
	Measuring Model	MEAS: for measuring pH, U/mV, T/C , Ipol, Upol	
	Calibration	pH Calibration with automatic buffer	
	pH Range	-13.0 to +20.0 pH	
	pH Resolution	0.001 pH	
	pH Accuracy	± 0.003	
	mV Range	± 1200 mV	
	mV Resolution	0.1 mV	
	mV Accuracy	± 0.2	
	Temperature Range	-150 to +250 C	
	Temperature Resolution	0.1 °C	
	Temperature Accuracy	±0.2	
	I-pol and U-pol	-120 and +120 uA U-pol: -1200 and +1200 mV	
	Increment/ Cylinder Volume	20,000 per Cylinder Volume	
	Model of Titration	Dynamic Equivalent-point Titration (DET)	
		Monotonic Equivalent Titration (MET)	
		SET endpoint titrations (SET) with automatic conditioning	
	Temperature Sensor	pT 1000 or NTC	
	Inputs and Outputs	One high-impedance input for pH , selective electrode	
		Separate Input for reference electrode	
		Separate input for a polarized electrode	
		Input PT100 or PT1000 resistance thermometer	
		Outputs: 2 USB slave port and 2 MSB port	



	Touch Control	To be mentioned	
12	Carry Case	Yes	
13	UPS	To be mentioned	
14	Display	Yes	
15	Accessories	Yes	
16	Printer	To be mentioned	
17	Dimension	To be mentioned	
18	Weight	To be mentioned	
19	Environment & Others		
	Operating temperature	+5°C to +50 °C	
	Humidity	20% - 85% RH	
	Standard followed for safety and EMC conformity	To be mentioned	
	All necessary accessories	To be mentioned	

Document Requirements:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

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53. Guaranteed Technical Particulars (GTP) for INSULATING OIL DIELECTRIC BREAKDOWN TEST SET

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Description of the Item	The Oil Test Set shall be fully automatic liquid dielectric test sets, typically used for testing the breakdown voltage level of insulating oils, hydraulic oils, and other dielectric fluids	



2.	Name of the Manufacturer	To be mentioned	
3.	Address of the manufacturer	To be mentioned	
4.	Type	To be mentioned	
5.	Model number	To be mentioned	
6.	Country of origin	USA/UK/EU/Canada /Australia/Japan	
7.	Country of Manufacturer	USA/UK/EU/Canada /Australia/Japan	
8.	Country of Shipment	To be mentioned	
9.	Standard	ASTM D-877 and IEC 156	
10.	Display	Color display with backlight option, minimum 2.5 inch. Display.	
11.	Interface	USB	
12.	Vessels	400ml (Standard), chemical resistant clear polymer/Glass.	
13.	Controls	Clear and easy to use	
14.	Standard test sequences	Standard test sequences: ASTM D1816/12, ASTM D877/13, IEC 156/95, VDE 370, BS EN 60156-96, CEI EN 60156-95 etc.	
15.	Memory	Internal memory holds last 50 test results (minimum).	
16.	Temperature sensor	Ambient	
17.	Language	English	
18.	Printer	Built-in.	
19.	Input	230 VAC $\pm 10\%$, 50Hz	
20.	Test Voltage	0-100 kV AC	
21.	Voltage Rise time	0.5 kV/s, 2.0kV/s, 3.0kV/s	
22.	Voltage Rise time Accuracy	$\leq 5.0\%$	
23.	Voltage Resolution	0.1 kV $\pm 1\%$	
24.	Power Source	150V – 260V min.	
25.	Battery Life	Consecutive 10 tests (minimum) with backlit on.	
26.	Electrode	IEC, ASTM or universal	
27.	Data Management	Internal memory, Keypad for easy entry.	
28.	Test Cells	To be mentioned	
29.	Weight	Not more than 30 kg	
30.	Dimension	To be Mentioned	
31.	Operating temperature	0 °C to 50 °C	
32.	Humidity	85% RH	
33.	Dimension	To be mentioned	
34.	Warranty	Standard one year	
35.	Accessories to be supplied	Shipping Container	
36.	Safety and EMC conformity	IEC 61010, IEC 61326-1	
37.	Standard followed for safety and EMC conformity	Declaration of conformity	

Documents requirement:

1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.



		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
		● Country of origin Certificate
2 .	Document to be supplied during supply	● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



54. Guaranteed Technical Particulars (GTP) for INSULATING OIL TAN DELTA TEST SET

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
1.	Description of the Item	Insulating Oil Tan-δ Test Set	
2.	Name of the Manufacturer	To be mentioned	
3.	Address of the manufacturer	To be mentioned	
4.	Type	To be mentioned	
5.	Model number	To be mentioned	
6.	Country of origin	USA/UK/EU/Canada /Switzerland/Australia/Japan	
7.	Country of Manufacturer	USA/UK/EU/Canada /Switzerland/Australia/Japan	
8.	Country of Shipment	To be mentioned	
9.	Standards	IEC/IEEE/CIGRE/ANSI or equivalent	
10.	Power Supply	90 - 250 VAC, 50 Hz	
11.	Measure of Tan-Delta:		
	Test Voltage	500V – 2000V ac 50Hz	
	Accuracy	± 2% ± 1 V	
	Capacitance	0-70 pF	
	Accuracy	± 0.1% of reading, ± 0.1 pF	
	Best Resolution	0.01 pF	
	Dissipation factor (DF)	1*10 ⁻⁵ to 3.000 (or more)	
	Accuracy	± 1% reading ± 1 x 10 ⁻⁵	
	Resolution	1x10 e ⁻⁵	
	Oil Test Cell Heater		
	Temperature range	10° C to 110° C	
	Temperature control	Yes	
	Indication	Yes	
	Sensing probe	Solid state	
	Heating element	To be mentioned	
16	Environment & Others		
	Operating temperature	-5 °C to 45 °C	
	Humidity	85% RH	
	Dimension	To be mentioned	
	Standard followed for safety and EMC conformity	To be mentioned	
	All necessary accessories	To be mentioned	
	PC Interface	USB or RJ45	

Document Requirements:

1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.



		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
		● Country of origin Certificate
2 .	Document to be supplied during supply	● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



55. Guaranteed Technical Particulars (GTP) for DGA test kit (Gas Chromatography)

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. No.	Description	Required Specification	Bidder's Guaranteed Particulars
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin & Country of Manufacturer	USA/ Canada/ EU/ UK/ Japan/ Australia	
5	Power Supply	Single Phase 230V $\pm$ 10 % 50Hz $\pm$ 10% for Vacuum/Filling pump	
6	Standards	IEC 60599, IEEE C57.104, CIGRE 296, , and ASTM 3612	
7	Measuring method	Gas Chromatography	
8	Gas Measured	H2 – hydrogen CH4 – methane C2H6 – ethane C2H4 – ethylene C2H2 – acetylene CO – carbon monoxide CO2 – carbon dioxide O2 – oxygen N2 – nitrogen TCG – total combustible gas content (H2, CH4, C2H4, C2H6, C2H2, CO, C3H6, C3H8)	
9	Gas in Oil Measuring Range	H2 : 5 - 60,000 ppm Other fault gases: 1 - 60,000 ppm O2 : 60 — 100,000 ppm N2 : 500 — 100,000 ppm	
10	Gas in Oil Repeatability	H2 : greater of ± 2 ppm or $\pm 2\%$ CO2 : greater of ± 10 ppm or $\pm 2\%$ Other fault gases: greater of ± 2 ppm or $\pm 2\%$ O2 : ± 60 or $\pm 2\%$ N2 : ± 500 or $\pm 2\%$	
11	Gas in Oil Accuracy	H2 : greater of ± 5 ppm or $\pm 6\%$ CO2 : greater of ± 10 ppm or $\pm 6\%$ Other fault gases: greater of ± 2 ppm or $\pm 6\%$ O2 : ± 60 ppm or $\pm 6\%$ N2 : ± 500 ppm or $\pm 6\%$	
12	Resolution	All gases: 1 ppm	
13	Automated Calibration	Periodic automated calibration with Standard Calibration GAS with NIST traceability	



14	Communication & Data	USB, networked TCP/IP Ethernet	
15	Mounting	Lab Eniurement 	
16	DGA interpretation methods	IEC, IEEE, CIGRE, Key Gas Method, Rogers Ratio, Doenenburg Ratio, Duval Triangle Method, and Duval Pentagon Method	
17	DGA Reporting	PDF	
18	Environmental Conditions	-10 to 60°C, indoor/outdoor in fair weather Humidity <95% non-condensing Altitude <3300 ft (1000 meters)	
19	Safety	IEC/EN 61010-01-2001, EMC 2004/108/EC, IEC 61326-1-2005, EN61326-1-2006	
20	Warranty	Standard one year	

Documents requirement:

1.	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.
		● Manufacturer's Safety Certificate of Conformity.
		● Manufacturer's Certificate of test Conformity
		● Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	● Country of origin Certificate
		● Copy of Shipping documents
		● Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



56. Guaranteed Technical Particulars (GTP) for Online DGA Test Kit

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

S l. n o .	Description	Required Specification	Bidder's Guarante ed Particular s
1	Brand	Any International reputed brand (mentioned by the Tenderer)	
2	Model	To be mentioned by the Tenderer	
3	Country of Origin	USA/ Canada/ EU/ UK/ Japan/ Australia/ Finland	
4	Country of Manufacture	USA/ Canada/ EU/ UK/ Japan/ Australia/ Finland	
5	Power Supply	Single Phase 230V $\pm$ 10 % 50Hz $\pm$ 10% for Vacuum/Filling pump	
6	Standards	IEC 60599, IEEE C57.104, CIGRE 296, , and ASTM 3612	
7	Measuring methods	Optical measurement, Photo-acoustic spectroscopy (PAS), Fourier Transform Infra-Red (FTIR) Any of above	
8	Gas Measured	H ₂ – hydrogen CH ₄ – methane C ₂ H ₆ – ethane C ₂ H ₄ – ethylene C ₂ H ₂ – acetylene CO – carbon monoxide CO ₂ – carbon dioxide H ₂ O – Moisture	
9	Gas in Oil Measuring Range	Hydrogen (H ₂) : 5 - 5,000 ppm Methane (CH ₄) : 0 – 10, 000 ppm Ethane (C ₂ H ₆) : 0 – 10, 000 ppm Ethylene (C ₂ H ₄) : 0 – 10, 000 ppm Acetylene (C ₂ H ₂) : 0 – 5, 000 ppm Carbon monoxide (CO) : 0 – 10, 000 ppm Carbon dioxide (CO ₂) : 0 – 10, 000 ppm Moisture) (H ₂ O) : 0 – 100 ppm	
10	Gas in Oil Repeatability	$\pm$ 5 %	
11	Gas in Oil Accuracy	$\pm$ 10 %	



1 2	Measurement cycle	Selectable from 1 hour	
1 3	Data storage	10 Years	
1 4	Communication & Data	RS-485, Modbus RTU, USB, Ethernet, DNP3, IEC 61850	
1 5	Mounting	Stainless steel AISI 316 (OPTPSU) weather proof enclosure 	
1 6	DGA interpretation methods	IEC, IEEE, CIGRE, Key Gas Method, Rogers Ratio, Doenenburg Ratio, Duval Triangle Method, and Duval Pentagon Method	
1 7	Alarms	3 pcs, normally open (NO) or normally closed (NC), user selectable	
1 8	Environmental Conditions	-10 to 60°C, indoor/outdoor in weather Humidity <95% non-condensing Altitude <3300 ft (1000 meters)	
1 9	Safety	IEC/EN 61010-01-2001, EMC 2004/108/EC, IEC 61326-1-2005, EN61326-1-2006	
2 0	Warranty	Standard one year	

Documents requirement:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

57. Technical Particulars (GTP) for Three Phase Automated Transformer Test Set

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

● 1.1 Manufacture Description

Sl. No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
1.1.1	Manufacturer's name & country (To be mentioned)	
1.1.2	Country of Origin & Country of manufacturing (USA/CANADA/UK/EU/Japan/Australia)	
1.1.3	Type / Model (To be mentioned)	

○ 2.1 TESTING CAPABILITIES

The test should be performed automatically however the capability to enable or disable individual test sequences should be possible to provide highest flexibility. One setup can be used to perform various tests. Following test capabilities should be included.

Sl. No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.1.1	TRANSFORMER TURNS RATIO	
2.1.2	EXCITING CURRENT	
2.1.3	DC WINDING RESISTANCE	
2.1.4	DYNAMIC RESISTANCE	
2.1.5	VECTOR GROUP CHECK	
2.1.6	SHORT-CIRCUIT IMPEDANCE / LEAKAGE REACTANCE	
2.1.7	FREQUENCY RESPONSE OF STRAY LOSSES	
2.1.8	DEMAGNETIZATION	
2.1.9	POWER / DISSIPATION FACTOR	
2.1.10	QUICK TEST	

○ 2.2 TEST APPLICATION

The test set should be able to test three phase automated transformers as stand-alone version. The test set should be able to perform the above test.

Sl. No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
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Sl. No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.2.1	Three phase automated testing of transformer turns ratio. Transformer turns ratio (TTR) measurements to verify the operating principle of a power transformer to detect shorted turns and open circuited conditions. To perform this test with up to 12kv voltage all required accessories shall be supplied.	
2.2.2	Three phase automated testing of power transformer exciting current. Exciting current measurements are performed to assess the turn-to-turn insulation of the windings, the magnetic circuit of a transformer as well as the tap changer. To perform this test with up to 12 kV voltage all required accessories shall be supplied.	
2.2.3	Three phase automated testing of transformer DC winding resistance. DC winding resistance measurements with powerful source current of 30A.	
2.2.4	Three phase automated testing of transformer dynamic resistance. Dynamic resistance measurements (DRM) for checking the on-load tap changer (OLTC) for poorly maintained and damaged OLTC contacts.	
2.2.5	Automated testing of transformer vector group check. To determine the vector group of the power transformer or verification of power transformer vector group.	
2.2.6	Automated testing of transformer short circuit impedance / leakage reactance. Leakage reactance / short-circuit impedance measurement to assess possible deformation or displacements of windings.	
2.2.7	Automated testing of transformer frequency response of stray losses. The frequency response of stray losses (FRSL) test to identify short-circuits between parallel strands and local overheating due to excessive eddy current losses.	
2.2.8	Automated testing of transformer demagnetization. Demagnetization of the core after DC application, (e.g. during winding resistance tests) to avoid the risk of high inrush currents during energization and to reduce influences on other tests.	
2.2.9	Transformer power/dissipation factor measurement. To perform power/dissipation factor and capacitance measurements to investigate the insulation of power transformers and bushings. To perform this test with up to 12 kv voltage all required accessories shall be supplied.	
2.2.10	QUICK TEST User defined test procedures to perform special measurements. like magnetic balance or zero-sequence impedance.	

○ 2.3 TECHNICAL DATA

3 individually controlled outputs which can be operated in AC or DC, voltage or current Model with the below specifications.

Sl. No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.3.1	All AC outputs are de-coupled from mains power supply frequency and have a variable output frequency between 15 Hz ... 599 Hz to avoid disturbances during the test.	
2.3.2	All outputs are galvanically isolated from mains.	
2.3.3	Current Outputs Model Channels: 3 3 Phase: 3 x 33 A AC @ 40 V 3 x 33 A DC @ 56 V	

	1 Phase: 1 x 100 A DC @ 56 V 1 x 33 A DC @ 170 V Frequency: 15 Hz ... 599 Hz Power: 4.000 W (for 30 sec.) 2.400 W (continues)	
2.3.4	In 3 Phase current Model, all three currents are supplied simultaneously. The phase shift between the three AC currents can be specified for each signal individually.	
2.3.5	Voltage Output Model ·Channels: 3 ·3 Phase: ○ 3 x230 V AC (L-N) / 400 V AC (L-L) @ 100 mA ·1 Phase: ○ 1 x 240 V AC @ 16 A ○ 1 x 340 V DC @ 16 A ·Frequency: 15 Hz ... 599 Hz ○4.000 W (for 30 sec.) ○2.400 W (continues)	
2.3.6	In 3 Phase Model, all three AC voltages are supplied simultaneously with a phase shift of 120°.	
2.3.7	Protection: Current and voltage outputs shall be overload and short-circuit proof and protected against over-heating.	

2.4 Power Supply

Sl. No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.4.1	Nominal input voltage: 100 V _{AC} ... 240 V _{AC} , 1-phase	
2.4.2	Permissible input voltage: 85 V _{AC} ... 264 V _{AC} (using L-E or L-L has to be possible; supply via a portable generator without	
2.4.3	Permissible frequency range: 45 Hz ... 65 Hz	

2.5 Measurement Inputs & Accuracy

Typical accuracy at typical temperatures of 23 °C ± 5 K

SI No.	PGCB REQUIREMENTS			Bidder's Guaranteed Particulars
2.5.1	Input	Range	Accuracy	
	AC (RMS)	0 ... 4 A _{RMS} 0 ... 40 A _{RMS}	0.036 % rd + 0.0033 % range 0.023 % rd + 0.013 % range	
	DC	0 ... 0.56 A _{DC} 0 ... 5.6 A _{DC} 0 ... 56 A _{DC}	0.1 % rd + 0.023 % range 0.037 % rd + 0.026 % range 0.008 % rd + 0.01 % range	
2.5.2	Input	Range	Accuracy	
	AC (RMS)	0 ... 300 mV 0 ... 3 V 0 ... 30 V 0 ... 300 V	0.01 % rd + 0.003 % range 0.01 % rd + 0.003 % range 0.01 % rd + 0.003 % range 0.012 % rd + 0.003 % range	
	DC	0 ... 42.4 mV 0 ... 424 mV	0.022 % rd + 0.032 % range 0.01 % rd + 0.017 % range	

		0 ... 4.24 V 0 ... 42.4 V 0 ... 424 V	0.007 % rd + 0.012 % range 0.01 % rd + 0.017 % range 0.007 % rd + 0.012 % range	
2.5.3	Current	Range	Accuracy	
	3 A _{DC}	10 ... 100 Ω 1 ... 10 Ω 0.1 ... 1 Ω	0.1 % rd + 0.18 % range 0.1 % rd + 0.267 % range 0.1 % rd + 0.18 % range	
	30 A _{DC}	1 ... 10 Ω 0.1 ... 1 Ω 0.01 ... 0.1 Ω 0.001 ... 0.01 Ω 0.0001 ... 0.001 Ω	0.037 % rd + 0.017 % range 0.04 % rd + 0.027 % range 0.033 % rd + 0.017 % range 0.037 % rd + 0.027 % range 0.05 % rd + 0.043 % range	
	100 A _{DC}	3 ... 30 mΩ 300 ... 3000 μΩ 30 ... 300 μΩ 3 ... 30 μΩ	0.033 % rd + 0.017 % range 0.037 % rd + 0.027 % range 0.05 % rd + 0.043 % range 0.07 % rd + 0.44 % range	

2.6 Tap Changer Contacts

Sl. No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.6.1	2 contacts for up and down switching of tap changer	
2.6.2	Current Rating: 300 mA continuous, 9 A for 0.7s Voltage Rating: 300 V AC	

2.7 Ratio Measurement & Accuracy

Sl. No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars										
2.7.1	<table><tr><th>Range</th><th>Accuracy₃</th></tr><tr><td>1:1 ... 10</td><td>0.03 % rd + 0.043 % range</td></tr><tr><td>1:10 ... 100</td><td>0.027 % rd + 0.043 % range</td></tr><tr><td>1:100 ... 1000</td><td>0.027 % rd + 0.043 % range</td></tr><tr><td>1:1000 ... 10 000</td><td>0.027 % rd + 0.043 % range</td></tr></table>	Range	Accuracy ₃	1:1 ... 10	0.03 % rd + 0.043 % range	1:10 ... 100	0.027 % rd + 0.043 % range	1:100 ... 1000	0.027 % rd + 0.043 % range	1:1000 ... 10 000	0.027 % rd + 0.043 % range	
	Range	Accuracy ₃										
	1:1 ... 10	0.03 % rd + 0.043 % range										
	1:10 ... 100	0.027 % rd + 0.043 % range										
	1:100 ... 1000	0.027 % rd + 0.043 % range										
	1:1000 ... 10 000	0.027 % rd + 0.043 % range										

• 2.8 Hardware Specification

○ HARDWARE GENERAL

Sl.No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.8.1	All power outputs electronically stabilized so mains voltage disturbances do not affect the output signals (completely independent from power supply).	
2.8.2	Rugged housing for outdoor use	

2.8.3	Transport case with wheels for shipment and transportation within substations.	
2.8.4	One box solution preferred to multiple single units (external amplifiers/boosters are allowed for special applications such as e.g. 12 kV for PF/Tan Delta measurements).	
2.8.5	PC control should be possible. Software should be provided to allow control of the test device via PC.	
2.8.6	Additional Data storage facility should be on USB memory stick.	
2.8.7	Front panel control with 6 inch or larger graphical user interface – operation in bright sunlight has to be possible	

2.9 Software and Reporting (PTM Standard)

Sl.No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.9.1	PC Software to test transformers where the device is controlled by the PC.	
2.9.2	PC Software to prepare tests in advanced and create user defined test templates.	
2.9.3	Reporting of the performed measurement with Word and .pdf.	
2.9.4	Data storage of test results directly on the device or on the PC after performing the test.	
2.9.5	Reporting for further data processing and calculation based on MS Excel – Import of the test results into MS Excel	
2.9.6	Templates for the most common application to perform the test faster and easier.	
2.9.7	PC Interface to control the device and obtain the results.	
2.9.8	Tabular and graphical representation of results.	

2.10 Licence and Accessories

Sl.No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.10.1	Software licenses for quick test, transformer turns ratio (TTR) / exciting current, DC winding resistance, demagnetization, short-circuit impedance / leakage reactance, frequency response of stray losses (FRSL), dynamic resistance measurement (DRM), power / dissipation factor and capacitance, power losses at low voltage, vector group check.	
2.10.2	User manual / Getting started / Installation CD	
2.10.3	Cables and accessories 4 × Kelvin clamp red 4 × Kelvin clamp black 2 × Kelvin clamp (3 × 4 mm connector red, 1 × 4 mm connector black) 1 × Grounding cable 6 mm ² (6 m / 19.5 ft.) 3 × Elastic rope with cable clamp and hook 1 × HV cable (15 m / 49 ft) 1 × LV cable (15 m / 49 ft) 1 × Tap changer cable (15 m / 49 ft) 1 × Ethernet PC connection cable (3 m / 10 ft.) 1 × Power cord 1 × Movement Trolley 1 × Transport case for all test units and accessories.	

○ 2.11 REPORTING

The test should be able to deliver adequate tools to report the received results and allow the user to design own report sheets

SI No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.11.1	Test files generated from the test equipment should be protected for any manipulation	
2.11.2	Test files changed or manipulated should indicate this clear in the report	
2.11.3	Test results should be able to import into Microsoft® Word and Excel	
2.11.4	Report templates should be user customizable in terms of design and data content	
2.11.5	Test preparation on a PC in advanced should be possible	

○ 2.12 ENVIRONMENTAL CONDITION

SI No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.12.1	<i>Climate</i>	
	The test device should have an operating temperature range of -10°C to +50°C (14°F to 122°F)	
	The test device should have a storage temperature range of -25°C to +70°C (-13°F to 158°F)	
	The test device should operate up to 2m (6.560 ft) altitude	
2.12.2	The test device should have an operating humidity range of 5% to 95% R.H. (non-condensing) Tested acc. to IEC 60068-2-78, Cab, Damp Heat: Temp. 40°C (104°F), duration 48 h, rel.humidity 95%	
	<i>Shock and Vibration</i>	
	Tested according to IEC 60068-2-6; frequency range 10 to 150 Hz; acceleration 2g continuous (20 m/s ²); 20 cycles per axis	
	Tested according to IEC 60068-2-27 (operating Model); 15g / 11ms, half-sinusoid, 3 shocks in each axis	

○ 2.13 SAFETY

SI. No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.13.1	The test device should have valid certificate stating that it has satisfied the following safety standards: - Europe EN 61010-1 - International IEC 61010-1 - USA UL 61010-1	

- **2.14 Quality& Sustainability**

SI No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.14.1	Manufacturer of test set should be ISO9001 2008 certified	
2.14.2	Type test report from vendor should be made available on request	
2.14.3	Manufacturer should be ISO 14001 (environmental management system) certified	
2.14.4	Manufacturer should be OHSAS 18001 (Occupational Health- and Safety Assessment Series) certified	

●

- **2.15 Documentation**

SI No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.15.1	Printed user manual should be supplied	
2.15.2	Electronic version of the user manual should be supplied	
2.15.3	Electronic version of remote interface description should be supplied	
2.15.4	Application notes should be supplied	

●

- **2.16 Test and calibration**

SI No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.16.1	Final Factory calibration report should be delivered with each unit	
2.16.2	Calibration according to ISO 17025 should be offered optionally	
2.16.3	Factory Acceptance Test should be possible on request	
2.16.4	Recalibration service should be offered by the manufacturer (Standard factory calibration and calibration according to ISO 17025)	
2.16.5	Calibration at the customer side should be possible and available optionally	

●

- **2.17 References**

The manufacturer of the test equipment should have long time experience in high voltage applications and measurement equipment for these applications. The test set should be field proven and in the market for at least five years. Customer references should be shown on request.

SI No.	PGCB REQUIREMENTS	Bidder's Guaranteed Particulars
2.18.1	Reference list of main customers	
2.18.2	Test reports from metrological institutes like PTB or KEMA	

Documents requirement:

1	Certificates to be supplied with the tender document	● Manufacturer's EMC Certificate of Conformity
		● Manufacturer's valid ISO Certificate.



2	Document to be supplied during supply	• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
		• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

58. Guaranteed Technical Particulars (GTP) for EARTH GROUND TEST SET / Tower Footing Resistance Meter

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	PGCB Requirement	Manufacturer's Guaranteed Particulars
20.	Description of the Item	Earth Ground Test Set	
21.	Name of the Manufacturer	To be mentioned	
22.	Address of the manufacturer	To be mentioned	
23.	Type	To be mentioned	
24.	Model number	To be mentioned	
25.	Country of origin	USA/UK/EU/Canada /Switzerland/Australia/Japan	
26.	Country of Manufacture	USA/UK/EU/Canada /Switzerland/Australia/Japan	
27.	Country of Shipment	To be mentioned	
28.	Standards	IEC/IEEE/CIGRE/ANSI or equivalent	
10.	Power Supply	Battery Operated	
11.	Measurement:		
	Measuring Range	0 to 48V AC	
	Test Frequency	10Hz to 200Hz	
	Short-circuit current	> =200mA	
	Measurement method	2-pole, 3-pole, 4-pole and ground loop measurement supported.	
	Stakeless ground loop measurement		
	Measuring range	0.02Ω to 199 Ω	
	Resolution	0.001Ω to 0.1Ω	
	Accuracy	± 7%	
	2-pole/ 3-pole/ 4-pole ground resistance measurement		
	Measuring range	0.020Ω to 19kΩ	
	Resolution	0.001Ω to 10Ω	
	Accuracy	± 7%	
16	Environment & Others		
	Display	4 Digit. Clear and visible display in daylight.	
	Memory	Internal memory of minimum 500 records	
	Data download to PC	Yes	
	Operating temperature	-5 °C to 50 °C	
	Storage temperature	-10 °C to 50 °C	
	Humidity	85% RH	



	Dimension	To be mentioned	
	Standard followed for safety and EMC conformity	To be mentioned	
	All necessary accessories	To be mentioned	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



59. Guaranteed Technical Particulars (GTP) for Vacuum Interrupter Test Set

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no.	Description	Required Specification	Bidder's Guaranteed Particulars
29.	Description of the Item	Vacuum Interrupter Test Set	
30.	Name of the Manufacturer	To be mentioned	
31.	Address of the manufacturer	To be mentioned	
32.	Type	To be mentioned	
33.	Model number	To be mentioned	
34.	Country of origin	USA/UK/EU/Canada /Switzerland/Australia/Japan	
35.	Country of Manufacture	USA/UK/EU/Canada /Switzerland/Australia/Japan	
36.	Country of Shipment	To be mentioned	
37.	Standards	IEC/IEEE/CIGRE/ANSI or equivalent	
10.	Power Supply	90 - 250 VAC, 50 Hz	
11.	Measurement:		
	Voltage Range	10kV – 60kV DC	
	Voltage change per step	Selectable (To be mentioned)	
	Ripple	3% (max.)	
	Automatic voltage discharge	Yes	
	High voltage safety indicator	Yes	
12.	Environment & Others		
	Supply voltage	115-230 V AC, 50Hz	
	Operating temperature	-5 °C to 70 °C	
	Storage temperature	-20 °C to 70 °C	
	Humidity	90% RH	
	Dimension	To be mentioned	
	Standard followed for safety and EMC conformity	To be mentioned	
	All necessary accessories	To be mentioned	

Documents requirement:

1.	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2.	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



60. Guaranteed Technical Particulars (GTP) for Digital Multimeter Test Set

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. no	Description	Required Specification	Bidder's Guaranteed Particulars
27.	Description of the Item	Supplying of brand new, light weight, rugged & robust Digital Multimeter having high accuracy and high quality without disturbance in high electromagnetic field.	
28.	Name of the Manufacturer	To be mentioned	
29.	Address of the manufacturer	To be mentioned	
30.	Type	To be mentioned	
31.	Model number	To be mentioned	
32.	Country of origin	USA/UK/EU/Canada /Switzerland/Australia/Japan	
33.	Country of made	USA/UK/EU/Canada /Switzerland/Australia/Japan	
34.	Construction	Digital, Light weight, Pocket sized, rugged, robust.	
35.	DC Voltage	Range: 0 – 600.0mV/6.0V/60.0V/600.0V; Resolution: 0.1mV/0.001V/0.01V/0.1V Accuracy: 0.5% ± 2 counts	
36.	DC Current	Range: Up to 6.0A/10.0A; Resolution: 0.001/0.01 A Accuracy: ±1.0%	
37.	AC Voltage	Range: 0 – 6.0V/60.0V/600.0V; Resolution: 0.001V/0.01V/0.1V Accuracy: ±2.5%	
38.	AC Current	Range: Up to 6.0A/10.0A; Resolution: 0.001/0.01 A Accuracy: ±1.0%	
39.	Frequency	Range: To be mentioned Resolution: To be mentioned Accuracy: To be mentioned	
40.	Resistance	Range: 0 – 600 Ω/6.0 kΩ/ 60.0 kΩ/ 600.0 kΩ/ 6.0 MΩ/40.0 MΩ/ Resolution: 0.1 Ω/0.001 kΩ/0.01 kΩ/0.1 kΩ/0.001 MΩ/0.01 MΩ Accuracy: ±0.9% +1	
41.	CAT Rating	CAT III 1000 V / CAT IV 600 V	
42.	Backlight	Yes	
43.	Auto Shutoff	Yes	
44.	AC Response	True RMS	
45.	Data hold option	Yes	
46.	Battery Life	>300 Hours	
47.	Jaw opening	To be mentioned	
48.	Dimension	To be mentioned	
49.	Weight	To be mentioned	
50.	Operating Temperature	0°C – 50°C	
51.	Storage Temp	0°C – 60°C	
52.	Warranty	Standard one year	
53.	Safety Conformity	IEC 61010-1, Pollution Degree 2 or equivalent	



Sl. no .	Description	Required Specification	Bidder's Guaranteed Particulars
54.	Calibration Certificate	To be Provided	
55.	Manufacturer Authorization Letter	To be provided	
56.	Accessories to be supplied	Standard Accessories to be supplied	

Documents requirement:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer



61. Guaranteed Technical Particulars (GTP) for Multi-Functional Primary Test System for Substation Commissioning and Maintenance

(To be filled up with the Sealed & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

The test set should comply with the following general requirements.

SI No.	Required	Comply	Comment
2.1	Multi-functional test facility for assets like Power Transformer, Current Transformer, Voltage Transformer, Grounding System, Power Lines, Circuit Breaker etc. in single device	☐	
2.2	Offline test preparation possibilities	☐	
2.3	Automatically guided testing facilities	☐	
2.4	Automated report generation & customizable reports	☐	
2.5	Testing capabilities in different frequencies	☐	
2.6	Fulfilling highest safety requirements	☐	
2.7	Testing assessment in accordance with IEEE and IEC standards	☐	
2.8	Software and hardware expand ability	☐	
2.9	Designed for operating in rough environmental condition with test field accuracy	☐	
2.10	Premium quality accessories	☐	
2.11	Light weight, compact design with easy mobility	☐	
2.12	Proper device earthing facility, overload protection, safety key-pad lock, Warning and Alarms	☐	
2.13	Country of Origin & Country of manufacturing (USA/CANADA/UK/EU/Japan/Austria)	☐	
2.14	Type/Model		To be mentioned

Testing Capabilities

The test set should be suitable for acceptance testing, commissioning, troubleshooting and routine testing of various assets such as Power Transformers, Current Transformers, Voltage Transformers, Power lines, Grounding system, Circuit Breakers, Resistances of different devices etc in accordance with applicable IEEE and IEC standards. The test set should be suitable for operation in high voltage substation environment without degradation in accuracy and should be able to operate continuously for up to 8 hours or more with a compact transportable design.

The test set should be able to perform the following tests, measurement, analyzing and reporting functions:

SI No.	Required	Comply	Comment
3.1	Current Transformer Testing		
3.1.1	CT RATIO (WITH AND WITHOUT BURDEN) UP TO 800A, 5KVA OUTPUT POWER	☐	
3.1.2	CT BURDEN WITH UP TO 6A AC (SECONDARY) CURRENT INJECTION		

3.1.3	▪ CT EXCITATION CURVE WITH (KNEE POINT) UP TO 2KV AC VOLTAGE INJECTION	☐	
3.1.4	▪ POLARITY CHECK WITH UP TO 800A AC CURRENT	☐	
3.1.5	▪ ACCURACY LIMITING FACTOR (ALF) TEST	☐	
3.1.6	▪ CT RATIO WITH VOLTAGE UP TO 130V AC	☐	
3.1.7	▪ WINDING RESISTANCE WITH UP TO 6V DC		
3.1.8	▪ CT DEMAGNETIZATION AND REMANANCE	☐	
3.1.9	▪ CT VOLTAGE WITHSTAND TEST WITH VOLTAGE UP TO 2KV AC	☐	
3.1.10	▪ CT RATIO ROGOWSKI AND CT RATIO LOW POWER UP WITH UP TO 800A, 5 KVA OUTPUT POWER	☐	
3.1.11	▪ POWER/DISSIPATION FACTOR TEST WITH UP TO 12KV/15KV, 300MA	☐	
3.1.12	▪ IEC 61850 SAMPLED VALUES TESTING	☐	
3.2	Voltage/Potential transformer testing		
3.2.1	VT ratio with voltage up to 2kV AC	☐	
3.2.2	VT burden with up to 130V AC (secondary)	☐	
3.2.3	VT secondary voltage withstand test up to 2kV AC	☐	
3.2.4	Polarity check with up to 2kV AC	☐	
3.2.5	VT electronics up to 2kV AC	☐	
3.2.6	IEC 61850 sampled value testing	☐	
3.2.7	Power/dissipation factor test with up to 12kV/15kV, 300mA	☐	
3.3	Power Transformer testing		
3.3.1	DC winding resistance with up to 100A DC	☐	
3.3.2	Transformer demagnetization	☐	
3.3.3	Dynamic load tap changer diagnostics (on load tap changer test) with up to 100A DC	☐	
3.3.4	Transformer turns ratio (TTR) per tap with up to 2kV AC including polarity and excitation current	☐	
3.3.5	IEC 61387-1 support for transformer with unconventional vector groups	☐	
3.3.6	Automatic determination of transformer vector groups	☐	

3.3.7	Leakage reactance/short circuit impedance with up to 6A AC	☐	
3.3.8	Transformer bushing: power/dissipation factor + insulation capacitance with up to 12kV/15kV, 300mA and frequency from 15Hz to 400Hz	☐	
3.3.9	Insulating fluids: power/dissipation factor + insulation capacitance with up to 12kV/15kV, 300mA	☐	
3.3.10	Excitation current per tap with up to 12kV/15kV, 300mA	☐	
3.3.11	Frequency response of stray losses (FRSL)	☐	
3.3.12	Surge arrestors: leakage current and watt losses up to 12kV/15kV, 300mA	☐	
3.4	Cable and transmission line diagnosis		
3.4.1	Line impedance and k-factor with up to 100A	☐	
3.4.2	Mutual coupling with up to 100A	☐	
3.4.3	Positive or zero sequence impedance	☐	
3.5	Ground system analysis		
3.5.1	Ground grid impedance for large systems with up to 100A	☐	
3.5.2	Step and touch voltage with up to 100A	☐	
3.5.3	Ground grid impedance for small systems with up to 6A AC	☐	
3.5.4	Soil resistivity with up to 6A AC	☐	
3.5.5	Integrity check of grounding connection with up to 400A DC	☐	
3.5.6	Reduction factor/current split factor	☐	
3.5.7	Measure multiple current paths with Rogowshki coil	☐	
3.6	Switchgear/Circuit Breaker testing		
3.6.1	Contact resistance with up to 400A DC	☐	
3.6.2	Bushing: power/dissipation factor ($\tan \delta$) + insulation capacitance 12kV/15kV, 300mA and frequency from 15Hz to 400Hz	☐	
3.6.3	Circuit Breaker: power/dissipation factor ($\tan \delta$) + insulation capacitance 12kV/15kV, 300mA and frequency from 15Hz to 400Hz	☐	
3.7	GIS Testing		
3.7.1	Withstand test up to 235kV (max 1.6nF). HV source for partial discharge measurements with up to 235V (max 1.6nF)	☐	

Hardware Specification

4.1 Hardware General

SI No.	Required	Fulfilled	Comment
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4.1.1	All power outputs electronically stabilized so mains voltage disturbances do not affect the output signals (completely independent from power supply)	☐	
4.1.2	Rugged housing for outdoor use	☐	
4.1.3	Transport case with wheels for shipment and transportation within substations	☐	
4.1.4	PC control should be possible. Software should be provided to allow control of the test device via PC.	☐	
4.1.5	Additional Data storage facility should be on USB memory stick	☐	
4.1.6	Front panel control with 6 inch or larger graphical user interface – operation in bright sunlight has to be possible	☐	

4.2 Power Supply

SI No.	Required	Fulfilled	Comment
	Nominal input voltage: 100 VAC ... 240 VAC, 1-phase	☐	
4.2.2	Permissible input voltage: 85 VAC... 264 VAC (using L-E or L-L has to be possible; supply via a portable generator without	☐	
4.2.3	Permissible frequency range: 45 Hz ... 65 Hz	☐	
4.2.4	Power consumption: < 3500 VA (<7000 VA for a time < 10 s)	☐	
4.2.5	Connection: IEC 320 / C20	☐	
4.2.6	Overload protection	☐	

4.3 Current Outputs

SI No.	Required	Fulfilled	Comment
4.3.1	AC: 0 to 800A	☐	
4.3.2	Voltage range: 0 to 800A AC at 6.0V (V_{max}), 4800VA ($Power_{max}$) for 25s	☐	
	Voltage range: 0 to 400A AC at 6.4V (V_{max}), 2560VA ($Power_{max}$) for 8 min.	☐	
	Voltage range: 0 to 200A AC at 6.5V (V_{max}), 1300VA ($Power_{max}$) for >2hr	☐	
	Frequency range: 15Hz to 400Hz	☐	
	Amplitude reading error < 0.10%	☐	
	Amplitude full scale error < 0.10%	☐	
	Phase full scale error < 0.10°	☐	
4.3.3	AC: 0 to 6A	☐	
4.3.4	Voltage range: 55V (V_{max}), 330VA ($Power_{max}$) for >2hr	☐	
	Frequency range: 15Hz to 400Hz	☐	
4.3.5	AC: 0 to 3A	☐	
4.3.6	Voltage range: 110V (V_{max}), 330VA ($Power_{max}$) for >2hr	☐	
	Frequency range: 15Hz to 400Hz	☐	
4.3.7	DC: 0 to 400A	☐	
	Voltage range: 0 to 400A DC at 6.5V (V_{max}), 2600VA ($Power_{max}$) for 2 min.	☐	
	Voltage range: 0 to 300A DC at 6.5V (V_{max}), 1950VA ($Power_{max}$) for 3 min.	☐	
	Voltage range: 0 to 200A DC at 6.5V (V_{max}), 1300VA	☐	

SI No.	Required	Fulfilled	Comment
	(Power _{max}) for >2hr		
	Amplitude reading error < 0.20%	☐	
	Amplitude full scale error < 0.05°	☐	
4.3.8	DC: 0 to 6A	☐	
4.3.9	Voltage range: 60V (V _{max}), 360VA (Power _{max}) for >2hr	☐	

4.4 Voltage Outputs

SI,N	Required	Fulfilled	Comment
4.4.1	AC: 0 to 2kV	☐	
4.4.2	Current range: 0 to 2kV AC at 1.25A (I _{max}), 2500VA (Power _{max}) for 1 min.	☐	
4.4.3	4.4.3Current range: 0 to 2kV AC at 0.5A (I _{max}), 1000VA (Power _{max}) for >2hr	☐	
4.4.4	Current range: 0 to 1kV AC at 2.5A (I _{max}), 2500VA (Power _{max}) for 1 min.	☐	
4.4.5	Current range: 0 to 1kV AC at 1.0A (I _{max}), 1000VA (Power _{max}) for >2hr	☐	
4.4.6	Current range: 0 to 500V AC at 5.0A (I _{max}), 2500VA (Power _{max}) for 1 min.	☐	
4.4.7	Current range: 0 to 500V AC at 2.0A (I _{max}), 1000VA (Power _{max}) for >2hr	☐	
4.4.8	Current range: 0 to 130V AC at 3.0A (I _{max}), 390VA (Power _{max}) for >2hr	☐	
4.4.9	Frequency range: 15Hz to 400Hz	☐	
4.4.10	Amplitude reading error < 0.20%	☐	
4.4.11	Amplitude full scale error < 0.05%	☐	
4.4.12	Phase full scale error < 0.20°	☐	

4.5 CURRENT & VOLTAGE INPUTS

SI N	Required	Fulfilled	Comment
4.5.1	Input Current: 0 to 10A AC/DC	☐	
4.5.2	Impedance < 0.1Ω	☐	
	Amplitude reading error < 0.05%	☐	
	Amplitude full scale error < 0.08%	☐	
	Phase full scale error < 0.15° (for AC only)	☐	
4.5.3	Input Voltage AC: 0 to 300A	☐	
4.5.4	Impedance < 10MΩ	☐	
	Amplitude reading error < 0.15%	☐	
	Amplitude full scale error < 0.25%	☐	
	Phase full scale error < 0.15°	☐	
4.5.5	Input Voltage DC: 0 to 10A	☐	
4.5.6	Amplitude reading error < 0.05%	☐	
	Amplitude full scale error < 0.15%	☐	

5 Hardware Accessories

The test set should be delivered with a test set including the following full set of necessary accessories according to the following description. Additional accessories may be provided as per the requirement

specified by the manufacturer.

SI No.	Required	Fulfilled	Comment
5.1	1x Main test set	☐	
5.2	1x User manual	☐	
5.3	1x Set of 2 standard high-current cables (minimum 9m)	☐	
5.4	1x Set of 2 standard high-voltage cables (2000V, minimum 6m)	☐	
5.5	1x Set of 6 standard measurement cables (minimum 6m)	☐	
5.6	1x Grounding cable (minimum 6m and 6mm ²)	☐	
5.7	1x Ethernet PC connection cable (minimum 3m)	☐	
5.8	1x Transport case with wheels for main test set	☐	
5.9	1x Carry bag for cables and accessories	☐	
5.10	1x Set of 4 connection clamps for high voltage	☐	
5.11	1x Low voltage adapter	☐	
5.12	1x Power cord for main test set	☐	
5.13	1x USB memory stick (at least 1GB)	☐	
5.14	1x Set of 4 crocodile clamps	☐	
5.15	1x DVD of the operating software	☐	
5.16	1x Audible beeper dongle (or built-in beeper)	☐	
5.17	1x Set of 3 jumper cables (25cm)	☐	
5.18	1x Surge Arrestor box (or built-in SA)	☐	

6 Software, Reporting and Licenses

The test set should be delivered with the following software capabilities and licenses.

SI No.	Required	Fulfilled	Comment
6.1	Software to test the described assets with the capability of controlling by PC	☐	
6.2	Software capable of preparing test cards in advance and creating user defined test templates	☐	
6.3	Reporting of the performed measurement with MS Word and .pdf	☐	
6.4	Data storage of test results directly on the device or on the PC after performing tests	☐	
6.5	Reporting for further data processing and calculation based on MS excel, importing the test results into MS excel	☐	
6.6	Templates for the most common application to perform the test faster and easier	☐	
6.7	PC interfaces to control the device and obtain results	☐	
6.8	Tabular and graphical representation of results	☐	
6.9	Test files generated from the test equipment should be protected for any manipulation	☐	
6.10	Test files changed or manipulated should indicate this clearly in the report	☐	
6.11	Required licenses and test cards		
6.12	Test card for manual Current & Voltage injection	☐	
	Test card for CT test	☐	
	Test card for VT test	☐	
	Test card Transformer test	☐	

SI No.	Required	Fulfilled	Comment
	Test card for resistance test	☐	
	Test card for Sequencing of Current & Voltage	☐	
	Test card for Ramping of Current & Voltage	☐	
	Test card for Grounding system analysis	☐	
	Test card for Tanδ/Power factor	☐	
	Test card for line impedance measurement	☐	

7 Environmental Condition

SI No.	Required	Fulfilled	Comment
7.1	Climate		
	The test device should have an operating temperature range of -10°C to +50°C (14°F to 122°F)	☐	
	The test device should have a storage temperature range of -25°C to +70°C (-13°F to 158°F)	☐	
	The test device should operate up to 2000m (6.560 ft) altitude	☐	
	The test device should have an operating humidity range of 5% to 95% R.H. (non-condensing) Tested acc. to IEC 60068-2-78, Cab, Damp Heat: Temp. 40°C (104°F), duration 48 h, rel.humidity 95%	☐	
7.2	Shock and Vibration		
	Tested according to IEC 60068-2-6; frequency range 10 to 150 Hz; acceleration 2g continuous (20 m/s ²); 20 cycles per axis	☐	
	Tested according to IEC 60068-2-27 (operating Modele); 15g / 11ms, half-sinusoid, 3 shocks in each axis	☐	
7.3	EMC - Emission		
	The test device should have valid certificate stating that it has satisfied the following standards: Europe EN 61326-1 Class A International IEC 61326-1 Class A USA FCC Subpart B of Part 15 Class A	☐	
7.4	EMC - Immunity		
	The test device should have valid certificate stating that it has satisfied the following standards: Europe EN 61326-1, International IEC 61326-1	☐	

8 Safety Standards

SI No.	Required	Fulfilled	Comment
8.1	The test device should have valid certificate stating that it has satisfied the following safety standards: - Europe EN 61010-1 - International IEC 61010-1 - USA UL 61010-1	☐	

9 Quality & Sustainability

SI No.	Required	Fulfilled	Comment
9.1	Manufacturer of test set should be ISO9001:2015 certified	☐	
9.2	Type test report from vendor should be made available on request	☐	
9.3	Manufacturer should be ISO 14001 (environmental management system) certified	☐	
9.4	Manufacturer should be OHSAS 18001 (Occupational Health- and Safety Assessment Series) certified	☐	

10 Documentation

SI No.	Required	Fulfilled	Comment
10.1	Printed user manual should be supplied	☐	
10.2	Electronic version of the user manual should be supplied	☐	
10.3	Electronic version of remote interface description should be supplied	☐	
10.4	Application notes should be supplied	☐	

11 Test and calibration

SI No.	Required	Fulfilled	Comment
11.1	Final Factory calibration report should be delivered with each unit	☐	
11.2	Calibration according to ISO 17025 should be offered optionally	☐	
11.3	Factory Acceptance Test should be possible on request	☐	
11.4	Recalibration service should be offered by the manufacturer (Standard factory calibration and calibration according ISO 17025)	☐	
11.5	Calibration at the customer side should be possible and available optionally	☐	

12 Customer support

SI No.	Required	Fulfilled	Comment
12.1	Vendor should have a toll-free technical support hotline available	☐	
12.2	24 hours support 7 days a week	☐	

13 References

The manufacturer of the test equipment should have long time experience in high voltage applications and measurement equipment for these applications. The test set should be field proven and in the market for at least five years. Customer references should be shown on request.

SI No.	Required	Fulfilled	Comment
13.1	Reference list of main customers	☐	
13.2	Test reports from metrological institutes like PTB or KEMA	☐	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

62. Guaranteed Technical Particulars (GTP) for Voltage Transformer Testing, Calibration and Assessment

The test set should comply with the following general requirements.

SI No.	Required	Comply	Comment
2.1	Checks electrical performances and conditions of IVTs and CVTs	☐	
2.3	Automatically guided testing facilities	☐	
2.4	Automated report generation & customizable reports	☐	
2.5	Testing capabilities in different frequencies	☐	
2.6	Fulfilling highest safety requirements	☐	
2.7	Automatic Testing assessment in accordance with IEEE and IEC standards	☐	
2.8	Determines a IVT's or CVT's equivalent circuit parameters	☐	
2.9	Displays all relevant VT parameters and its accuracy at different current and burdens and with loaded and unloaded secondary windings	☐	
2.10	Testing of IVT and CVT up to rated voltages and voltage factors up to 1.9	☐	
2.11	Used measuring voltages: up to 4kV	☐	
2.12	Testing by injecting low test signals into the secondary side of a IVT/CVT	☐	
2.13	Local isolation between high voltage and measuring equipment	☐	

2.16	Designed for operating in rough environmental condition with test field accuracy	☐	
2.17	Premium quality accessories	☐	
2.18	Light weight, compact design with easy mobility	☐	
2.19	Proper device earthing facility, overload protection, Warning and Alarms	☐	
2.20	Country of Origin & Country of manufacturing (USA/CANADA/UK/EU/Japan/Austria)	☐	
2.21	Type/Model		To be mentioned

1 TESTING CAPABILITIES

The test set should be suitable for acceptance testing, commissioning, troubleshooting and assessment of Inductive Voltage Transformers and Capacitive Voltage Transformers in accordance with applicable IEEE and IEC standards. The test set should be suitable for operation in high voltage substation environment without degradation in accuracy.

The test set should be able to perform the following tests, measurement, analyzing and reporting functions:

Sl No.	Required	Comply	Comment
3.1	Automated assessment		
	3.1.1 Available limit values for automated assessment in compliance with the applicable standards (IEC or IEEE)	☐	
	3.1.2 Complete transformer assessment considering: > Different burdens of secondary windings under test > Different primary voltage values > Each secondary winding under load and no-load conditions (while the others are either under load or without load)	☐	
3.2	Remote control		
	3.2.1 Whole measuring procedure can be controlled with PC based software	☐	
	3.2.2 Automatic testing procedures can be prepared	☐	
	3.2.3 Ability to export data into MS excel or XML format	☐	
3.3	Simulation and re-assessment		
	3.3.1 Reloading existing measurement data at any time for simulation	☐	
	3.3.2 Simulation and re-assessment of transformers under variation of following parameters: > Burdens (individually or each winding) > Nominal voltage factor > Accuracy class of transformer > Primary voltage	☐	
3.4	Data processing and reporting		
	3.4.1 Test results can be saved directly on the Compact Flash Card	☐	
	3.4.2 Reports can be generated through PC	☐	
	3.4.3 Customizable reports with MS excel	☐	
3.5	Safety facilities during testing		
	3.5.1 Guided wiring diagram for each single measurement	☐	

SI No.	Required	Comply	Comment
	3.5.2 Automatic switching among tests without changing physical wiring	☐	
	3.5.3 Acoustic warning sound before and during measurement with higher voltages	☐	
	3.5.4 Safety through surge arrestors for the measuring channels	☐	
	3.5.5 Grounding check confirmation	☐	
	3.5.6 Indication of operating state and safe state via LEDs	☐	
	3.5.7 Emergency stop button for safety interruption	☐	
3.6	Testing features		
	3.6.1 Ratio check of IVT and CVT	☐	
	3.6.2 Polarity check of IVT and CVT	☐	
	3.6.3 Measurements for IVTs and CVTs with up to as least 5 secondary windings	☐	
	3.6.4 Measurements for VTs as part of combined CT/CT units with up to as least 5 secondary windings	☐	
	3.6.5 IVT and CVT ratio and phase measurements under load and no-load condition	☐	
	3.6.6 IVT and CVT ratio error and phase displacement measurement in accordance with the standard > Primary voltage levels between 5% and 190% of the nominal primary voltage > Nominal burden and burden values below (0VA, 25% and 100% burden) > Other windings under load and no-load condition > Customized burden and Total simultaneous burden (TSB)	☐	
	3.6.7 Automatic assessment as per applicable standards up to accuracy class ≥ 0.1 > IEC 60044-2 for IVT > IEC 60044-5 for CVT > IEC 61869-3 for IVT > IEC 61869-5 for CVT > IEEE C57.13 for Instrument Transformers > ANSI C93.1 for CVT	☐	
	3.6.8 Automatic test and assessment of open delta winding	☐	
	3.6.9 Equivalent circuit parameter determination > IVT and CVT excitation curve measurement > Winding resistances > Leakage reactance	☐	
	3.6.10 Short-circuit impedance measurements	☐	
	3.6.11 Burden measurement	☐	

2 HARDWARE SPECIFICATION

▪ 4.1 HARDWARE GENERAL

SI No.	Required	Fulfilled	Comment
4.1.1	All power outputs electronically stabilized so mains voltage disturbances do not affect the output signals (completely independent from power supply)	☐	
4.1.2	Rugged housing for outdoor use	☐	

4.1.3	Transport case for shipment and transportation within substations	☐	
4.1.4	PC control should be possible. Software should be provided to allow control of the test device via PC.	☐	
4.1.5	Additional Data storage facility should be on USB memory stick	☐	
4.1.6	Front panel control with graphical user interface – operation in bright sunlight has to be possible	☐	
4.1.7	Maximum number of units of complete test set not exceeding 2 (two)	☐	
4.1.8	Maximum weight of each unit should be 8kg (without accessories and transport case)	☐	
4.1.9	Maximum dimension of a single unit not exceeding 15 inch in any side	☐	

○ **4.2 POWER SUPPLY**

SI No.	Required	Fulfilled	Comment
4.2.1	Nominal input voltage: 100 VAC ... 240 VAC, 1-phase	☐	
4.2.2	Permissible input voltage: 85 VAC... 264 VAC	☐	
4.2.3	Permissible frequency range: 45 Hz ... 65 Hz	☐	
4.2.4	Input power: 500VA	☐	
4.2.5	Connection: Standard AC socket as per IEC 60320	☐	

○ **4.3 TECHNICAL DATA**

SI No.	Required	Fulfilled	Comment
4.3.1	IVT and CVT basic testing		
	Typical accuracy for ratio measurements: 0.02%	☐	
	Typical accuracy for phase measurements: 0.7 min	☐	
	Resolution of winding resistance measurements: 1mΩ	☐	
	Typical accuracy for winding resistance measurements: 0.05%	☐	
4.3.2	Inductive voltage transformers		
	Typical accuracy for ratio measurement $\leq 0.03\%$ for voltage level: 0.6kV to 35kV (line to line)	☐	
	Typical accuracy for ratio measurement $\leq 0.05\%$ for voltage level: 35kV to 123kV (line to line)	☐	
	Typical accuracy for ratio measurement $\leq 0.08\%$ for voltage level: more than 123kV (line to line)	☐	
	Typical accuracy for phase displacement measurement ≤ 2 min for voltage level: 0.6kV to 35kV (line to line)	☐	
	Typical accuracy for phase displacement measurement ≤ 3 min for voltage level: 35kV to 123kV (line to line)	☐	
	Typical accuracy for phase displacement measurement ≤ 4 min for voltage level: more than 123kV (line to line)	☐	
4.3.3	Capacitive coupled voltage transformers		
	Typical accuracy for ratio measurement $\leq 0.05\%$ for voltage level: 30kV to 100kV (line to line)	☐	
	Typical accuracy for ratio measurement $\leq 0.07\%$ for	☐	

SI No.	Required	Fulfilled	Comment
	voltage level: 100kV to 500kV (line to line)		
	Typical accuracy for ratio measurement $\leq 0.09\%$ for voltage level: more than 500kV (line to line)	☐	
	Typical accuracy for phase displacement measurement ≤ 2 min for voltage level: 30kV to 100kV (line to line)	☐	
	Typical accuracy for phase displacement measurement ≤ 3 min for voltage level: 100kV to 500kV (line to line)	☐	
	Typical accuracy for phase displacement measurement ≤ 4 min for voltage level: more than 500kV (line to line)	☐	
4.3.4	Outputs		
	Output voltage: 0 to 120 V DC, 0 to 40 V AC	☐	
	Output current: 0 to 5A _{eff} (15 A _{peak})	☐	
	Output power: 0 to 400VA _{eff} (1500 VA _{peak})	☐	

3 HARDWARE ACCESSORIES

The test set should be delivered with a test set including the following full set of necessary accessories according to the following description. Additional accessories may be provided as per the requirement specified by the manufacturer.

SI No.	Required	Fulfilled	Comment
5.1	1x Main test set	☐	
5.2	1x Voltage Booster (if required for complying the described testing requirements)		
5.3	1x connection cable for connection between Main test set and Voltage Booster Unit (minimum 6m)	☐	
5.4	1x Safety box with cable (minimum 6m)	☐	
5.5	2x Grounding cable (minimum 6m, 6mm ²) with connection clamp	☐	
5.6	1x Standard measurement cable (minimum 6m)	☐	
5.7	1x Set consisting of two screened high-voltage cables (minimum 15m)	☐	
5.8	2x Multipole connection cable from Voltage Booster to Voltage transformer	☐	
5.9	3x Connection cable (minimum 0.5m) with 4mm banana socket	☐	
5.10	2x set consisting of four Kelvin clamp adapters	☐	
5.11	4x set consisting of two crocodile clamps with 4mm banana sockets	☐	
5.12	2x set consisting of 12 solid terminal adapters	☐	
5.13	1x set consisting of two Kelvin clamps with 4mm banana sockets	☐	
5.14	1x USB 3.0 Compact Flash Card reader	☐	
5.15	1x Compact Flash Card (512MB)	☐	
5.16	2x Power Cable	☐	
5.17	1x User manual	☐	
5.18	1x Power cable extension	☐	
5.19	1x Calibration confirmation	☐	
5.20	1x PC software CD	☐	
5.21	1x Hard case for Main Test set and Voltage	☐	

SI No.	Required	Fulfilled	Comment
	booster		
5.22	1x Carry bag for cables and accessories	☐	

4 SOFTWARE, REPORTING AND LICENSES

The test set should be delivered with the following software capabilities and licenses.

SI No.	Required	Fulfilled	Comment
6.1	Software to test the described assets with the capability of controlling by PC	☐	
6.2	Software capable of preparing test cards in advance and creating user defined test templates	☐	
6.3	Reporting of the performed measurement with MS Word and .pdf	☐	
6.4	Data storage of test results directly on the device or on the PC after performing tests	☐	
6.5	Reporting for further data processing and calculation based on MS excel, importing the test results into MS excel	☐	
6.6	Templates for the most common application to perform the test faster and easier	☐	
6.7	PC interfaces to control the device and obtain results	☐	
6.8	Test files generated from the test equipment should be protected for any manipulation	☐	
6.9	Test files changed or manipulated should indicate this clearly in the report	☐	
6.10	Software package for complete measurements and simulation of IVTs and CVTs up to accuracy class 0.1 with automatic IEC/IEEE class assessment	☐	

5 ENVIRONMENTAL CONDITION

SI No.	Required	Fulfilled	Comment
7.1	Climate		
	The test device should have an operating temperature range of -10°C to +50°C (14°F to 122°F)	☐	
	The test device should have a storage temperature range of -25°C to +70°C (-13°F to 158°F)	☐	
	The test device should operate up to 2000m (6.560 ft) altitude	☐	
	The test device should have an operating humidity range of 5% to 95% R.H. (non-condensing) Tested acc. to IEC 60068-2-78, Cab, Damp Heat: Temp. 40°C (104°F), duration 48 h, rel.humidity 95%	☐	
7.2	Shock and Vibration		
	Tested according to IEC 60068-2-6; frequency range 10 to 150 Hz; acceleration 2g continuous (20 m/s ²); 20 cycles per axis	☐	
	Tested according to IEC 60068-2-27 (operating Mode); 15g / 11ms, half-sinusoid, 3 shocks in each axis	☐	
7.3	EMC - Emission		

	The test device should have valid certificate stating that it has satisfied the following standards: Europe EN 61326-1 Class A International IEC 61326-1 Class A USA FCC Subpart B of Part 15 Class A	☐	
7.4	EMC - Immunity		
	The test device should have valid certificate stating that it has satisfied the following standards: Europe EN 61326-1, International IEC 61326-1	☐	

6 SAFETY STANDARDS

SI No.	Required	Fulfilled	Comment
8.1	The test device should have valid certificate stating that it has satisfied the following safety standards: - Europe EN 61010-1 - International IEC 61010-1 - USA UL 61010-1	☐	

7 QUALITY & SUSTAINABILITY

SI No.	Required	Fulfilled	Comment
9.1	Manufacturer of test set should be ISO9001:2015 certified	☐	
9.2	Type test report from vendor should be made available on request	☐	
9.3	Manufacturer should be ISO 14001 (environmental management system) certified	☐	
9.4	Manufacturer should be OHSAS 18001 (Occupational Health- and Safety Assessment Series) certified	☐	

8 DOCUMENTATION

SI No.	Required	Fulfilled	Comment
6.1	Printed user manual should be supplied	☐	
6.2	Electronic version of the user manual should be supplied	☐	
6.3	Electronic version of remote interface description should be supplied	☐	
6.4	Application notes should be supplied	☐	

9 TEST AND CALIBRATION

SI No.	Required	Fulfilled	Comment
11.1	Final Factory calibration report should be delivered with each unit	☐	
11.2	Calibration according to ISO 17025 should be offered optionally	☐	
11.3	Factory Acceptance Test should be possible on request	☐	
11.4	Recalibration service should be offered by the manufacturer (Standard factory calibration and	☐	

	calibration according ISO 17025)		
11.5	Calibration at the customer side should be possible and available optionally	☐	

10 CUSTOMER SUPPORT

SI No.	Required	Fulfilled	Comment
12.1	Vendor should have a toll-free technical support hotline available	☐	
12.2	24 hours support 7 days a week	☐	

11 REFERENCES

The manufacturer of the test equipment should have long time experience in high voltage applications and measurement equipment for these applications. The test set should be field proven and in the market for at least five years. Customer references should be shown on request.

SI No.	Required	Fulfilled	Comment
13.1	Reference list of main customers	☐	
13.2	Test reports from metrological institutes like PTB or KEMA	☐	

Documents requirement:

1	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

Seal & Signature of the Manufacturer

63. GUARANTEED TECHNICAL PARTICULARS (GTP) FOR

PORTABLE REFERENCE STANDARD METER CLASS 0.05 & POWER QUALITY ANALYZER

(To be filled up with the seal & Signed by both manufacturer and bidder in Manufacturer's Letterhead Pad, otherwise the bid will be rejected)

Sl. No.	Description	PGCB's Requirements	Manufacturer's Guaranteed Data
01	Mfg's Name and Address	To be mentioned	
02	Mfg's Type / Model	To be mentioned	
03	Country origin	USA/UK/EU/Canada/Japan.	
04	Application	3-phase portable reference standard should be designed for On-site and laboratory testing of CT operated and whole current electricity meters. Checking operating burden of PTs and CTs Checking CTs and PTs (transformer ratio, transformer error, phase angle between primary and secondary current and voltage) Testing other substandard meters Fully automatic tests in combination Power quality analyzing Verify the accuracy of 3-phase 4-wire, 3-phase 3-wire and single-phase electro-mechanical and electronic energy meters in the laboratory as well as at site without disconnecting consumers supply when used with the Clamp-	

		on CT.	
	Auxiliary supply input	85 V ... 265 V / 47 Hz ... 63 Hz	
	Using test voltage as power supply	Yes	
	Power supply with battery	To be mentioned if available	
	Measurement modes	- Single Phase 2 wire - Three Phase 3 wire / 4 wire - active / reactive true/reactive cross-connected/apparent - total/per phase	
	Housing	Hard plastic with rubber protection or Aluminum.	
	Transport case	Shall be supplied for basic device as well as accessories for outdoor transportation. Same Case should house all accessories	
	Dimensions	Not exceeding 350mm in any side	
	Weight	Not more than 4.5 kg	
	Ambient temperature	-10°C ... +50° C	
	Storage temperature	-15°C ... +60° C	
	Humidity Range	5% to 95% (non-condensing)	
	Protection degree acc. IEC 60529:2-2001	IP 30 or better	
	Isolation protection acc. EN61010-1:2002	Yes	
	Measurement category	300 V CAT IV; 600 V CAT III	
	CE certified	Yes	

Sl. No.	Description	PGCB's Requirements	Manufacturer's Guaranteed Data
	Test voltage range Resolution Error (voltage)	0.1 V ... 300 V (P-N) 0.01 V 0.05 %	
	Test Current range(direct) Error (current)	1 mA ... 12 A 0.05 %	
	Test Current range (clamps) Error (current)	10 mA ... 120 A (clamp-on CTs 120 A) 0.2 %	
	Phase angle measurement range	0 deg to 359.99 deg	
	Connection of High voltage and high cur- rent sensors for pri- mary tests in high volt- age networks (Option)	Yes	
	Auto ranging of voltage and current	Yes	
	Manual ranging of voltage and current	To be mentioned if available	
	Test frequency range	40 Hz ... 70 Hz	
	Calibration	Instrument should have power proportional pulse outputs for calibration of the unit by customer	
	Calibration Report	Final Factory calibration report should be delivered with each unit	
		The original manufacturer shall furnish valid calibration certificates of same rating of offered items in accordance with ISO 17025 from any National / International Accredited independent laboratory / Govt. Approved Labs.	

	Functions	• Internal error calculator for two meters under test, e.g. for simultaneous checking of up to two meters with different meter constants and/or different measurement modes • Statistical error evaluation incl. average error and standard deviation • Input for two scanning heads, two pulse cables or combination of scanning head and pulse cable • Simultaneous displaying of 3 phase actual values (Voltage, current, active/reactive/apparent power, power factor, phase angle, frequency) • Dial test of 3 registers in parallel • Registration of the average power for maximum demand test • Oscilloscope function with simultaneous displaying of U1, U2, U3, I1, I2 and I3 • Check of the connection by showing actual values as vector display • Burden measurement of CT and PT instrument transformers with consideration of additional cable impedances from the connection point to the instrument transformer. • Simultaneous test of 3 current or voltage transformers (transformer ratio, transformer error, phase angle between primary and secondary current/voltage)	
	Input of the meter constant	Imp/kWh; Imp/Wh; Imp/Ws; kWh/Imp; Wh/Imp; Ws/Imp; Imp/kvarh; Imp/varh; Imp/vars; kvarh/Imp; varh/Imp; vars/Imp	
	Optical sensor/scanning head along with connecting lead to be used to count revolutions of the disc and LED pulses.	Yes	

SI No.	Description	PGCB's Requirements	Manufacturer's Guaranteed Data
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	Inputs	3 x voltage 3 x current (direct) 1 x Clamp-on CT current input IN/IE 2 x Clamp-on CT current input I1, I2, I3 for connection of: - 3 x 100A Clamp-on CT - 3 x 1000A Clamp-on CT - 3 x 3000A FLEX 3000 current sensor input - 1 input for 3 current sensors in high voltage networks - 1 input for 3 high voltage sensors 2 Frequency / Scanning head input (one configurable as pulse output) 1 USB input 1 ETHERNET 1 Analogue modem 1 GSM modem (Option)	
	Output	Power proportional frequency output, free programmable for active/re- active/apparent power, resp. phase L1/L2/L3 or total (selectable by user program)	
	Integration time basis for actual value adjustable	Yes, [Include Range]	
	GPS time synchronization	Yes	

	Data storage	Built-in data storage for at least 1000 test results with the following instantaneous parameters: - Voltage of each phase - Current of each phase - Angle between voltage and current - Per phase and total active, reactive and apparent powers - Measuring mode - Vector diagram - Meter constant - Power Factor - Errors of meter under test - Total Harmonic Distortion - Particulars of substation, feeder and meter under test - Date and Time of testing Data storage facility with removable flash memory card of at least 256MB of size	
	Printer (Option)	Yes	
	WINDOWS PC software to remote control all functions including PQ-functions and read out/evaluate stored data (Option)	Yes, shall be provided with full license, there shall not be any time limit for the provided license	
	PC-WINDOWS software for fully automatic test procedures in combination with any MTE electronic source (Option)	Yes, shall be provided with full license, there shall not be any time limit for the provided license	
	HMI capability	- Front panel control with larger graphical user interface	
	Communication interface	- USB/Ethernet communication with PC	
	Self-diagnostic feature LCD/LED on the meter's display to indicate the healthiness.	Mention If available	

SI No.	Description	PGCB's Requirements	Manufacturer's Guaranteed Data
	Beep function for showing end of an actual value integration period or new error result	Yes	
	Voltage dips/swells/interruptions	Yes, according IEC 61000-4-30 Class A	
	Voltage Harmonics	Harmonics waveform analysis up to 30 th harmonics. The measured harmonic spectrum can be displayed in a chart or in a logarithmic diagram	
	Voltage Interharmonics	Harmonics waveform analysis up to 30 th interharmonics. The measured harmonic spectrum can be displayed in a chart or in a logarithmic diagram	
	Signal voltages	Yes, with $f < 3\text{kHz}$; according IEC 61000-4-30 Class A	
	Voltage unbalance	Yes, according IEC 61000-4-30 Class A	
	Voltage Flicker	Yes, up to 40 Hz according IEC 61000-4-30 Class A	
	Voltage transients	Yes, 0.9 kV / $\geq 200\text{ ms}$ (10 kHz)	
	Evaluation acc. EN50160	Yes	
	Current Harmonics	Harmonics waveform analysis up to 30 th harmonics. The measured harmonic spectrum can be displayed in a chart or in a logarithmic diagram	
	Current Interharmonics	Harmonics waveform analysis up to 30 th interharmonics. The measured harmonic spectrum can be displayed in a chart or in a logarithmic diagram	
	Inrush	Yes, according IEC 61000-4-30 Class A	
	Measurement neutral or earth current	Yes	
	Current transients	Yes, $\geq 200\text{ ms}$ (10 kHz)	

Documents requirement:

1 .	Certificates to be supplied with the tender document	• Manufacturer's EMC Certificate of Conformity
		• Manufacturer's valid ISO Certificate.
		• Manufacturer's Safety Certificate of Conformity.
		• Manufacturer's Certificate of test Conformity
		• Printed Manual/Catalogue and Brochures
2 .	Document to be supplied during supply	• Country of origin Certificate
		• Copy of Shipping documents
		• Valid Calibration Certificate

Seal & Signature of the Bidder/Tenderer

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