



OIL INDIA LIMITED

Items Specification

Head Code/Sub Code/Sub Sub Code/ Material No.	Description
0C000155	<p>: Insulation Resistance Tester, 5kV, Similar to Meggar make, Model: BM21or Equivalent. As per specifications provided in Annexure - I Make: Meggar/Fluke / Yokogowa/ AVO International.</p> <p>ANNEXURE-I SPECIFICATIONS OF DIGITAL /ANALOG INSULATION TESTER:</p> <p>1. Product should have the following Features: " Should have both Analogue and Digital Displays. " The instrument should show results and test options on a large, clear both analogue and digital scale for both practicality and precision. " Should have a built-in timer to make both spot tests and PI testing easier to carry out. " Should be powered by a built-in rechargeable lead-acid battery which can be charged directly from any supply from 95 V to 265 V. " All testers should incorporate a guard terminal to allow surface leakage to be removed. " Should have pre-set standard test voltages at 500 V, 1000 V, 2500 V and 5000 V with a variable test voltage in 25 V steps. " Should be able to measure resistance up to 5 TO, leakage current to 0, 01 nA and display capacitance at the end of a test to 10 μF. " Should have Breakdown or 'Burn' modes to allow choice of diagnostic approach.</p> <p>2. TECHNICAL SPECIFICATIONS: Parameters Range Test voltages (d.c.) 500, 1000, 2500, 5000 V; plus 25 to 5000 V in 25 V steps Accuracy (20°C) \pm5% on 100 MegaOhm load \pm25V for test voltages <500V Insulation Resistance Range Digital : 10 kOhm to 500 GOhm @ 500 V 10 kOhm to 1 TOhm @ 1000 V 10 kOhm to 2,5 TOhm @ 2500 V 10 kOhm to 5 TOhm @ 5 kV Analogue: 100 kOhm to 1TOhm @ all voltages Basic Accuracy \pm 5% of reading 1MOhm to 1 TOhm @ 5 kV (0</p>



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to 30°C) (32 to 86°F)

Short Circuit Current 1.8 mA nominal, 2 mA max.

Voltage Range Accuracy (20°C) 50 to 1000 V d.c. or a.c. (0 to 5000 V d.c. when testing)
Accuracy $\pm 2\%$, ± 1 V

Display Analogue/digital (3 digits)

Interference Rejection 1 mA r.m.s. per kV to a maximum 2 mA

Capacitor Discharge Time < 2 s per μF to discharge from 5000 V to 50 V

Leakage current measurement 0,01 nA to 999 μA Accuracy $\pm 5\%$
 ± 0.2 nA

Capacitance measurement 0.01 - 10.0 μF (displayed at end of test)
Accuracy $\pm 15\%$ ± 0.03 μF

Timer User selectable 0 to 90 minutes
Test is terminated at end of preset time

Temperature Range Operating -20 to +50°C (-4 to 122°F)
Storage -25°C to +65°C (-13 to 149°F)

Temperature Coefficient (Applies over range 0 to 30°C)
0.2% per °C for test currents >100 nA (0.1%/°F)
0.1% per °C for test voltage (0.05%/°F)

Humidity Range 90% RH @ 40°C max. (104°F)

Safety EC1010-1 (1995), EN61010 (1995) to installation category III, 300 V, phase to earth, 500 V phase to phase

3. General Specifications:

Power Supply: Rechargeable sealed lead-acid batteries (12 V, 4 Ah).

Battery life: Min 8 hrs continuous testing. Should have built in charger operates from 95 V to 265 V a.c., with recharge time: 8 hrs to 90%, 16 hrs to 100%, d.c. emergency charge socket from



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12 V d.c. Should have comprehensive battery state indicator on display.

Dimensions: (350 mm x 245 mm x 160 mm) + 2%

Weight: Max 6 kg

EMC: In accordance with IEC61326 including amendment No.1

Altitude: Up to 2000 m to retain full accuracy

4. Accessories to be supplied: High Voltage test lead, 3 m with clips (set of 3) ,Mains Supply lead for charging, Accessory pouch of leather, User Guide , Unique rugged casing



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: Digital Multimeter, similar to Make FLUKE, Model: Fluke-111 or equivalent with accessories,
As per specification provided in Annexure - II
Make: Fluke /Meggar/ Yokogowa / AVO International.

ANNEXURE-II SPECIFICATIONS OF DIGITAL MULTIMETER

1. Product should have the following Features:

- " Should measure true-rms ac voltage and current readings with basic dc accuracy of 0.7%
- " DISPLAY: Digital: 6000 count display , updates 4/sec
Bar Graph: 33 segments, updates 40/sec
Frequency: 9,999 counts
Capacitance: 9,999 counts
- " Should have manual reading hold for user convenience with Min/Max/Average function
- " Should have certification of Safety Compliances ANSI/ISA-S82.01-1988, CSA C22.2 No 231 and IEC 61010-1-95 Over voltage Category III (CAT III), 600V .
- " Should be auto ranging
- " Should have Min 3-year warranty
- " Battery door should be provides to battery access without breaking the calibration seal

2. Technical Specification of the instrument:- Function Specification

AC Current Range 0.01 mA to 10.00A
Accuracy \pm (1.5% of reading plus 3 counts)
Crest Factor < 3
AC Response 50 Hz to 500 Hz

DC Current Range 0.001A to 10.00A
Accuracy \pm (1.0% of reading plus 3 counts)

AC Voltage Range 1 mV to 600 V rms



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Accuracy \pm (1.0% of reading plus 3 counts)
AC Response 50 Hz to 500 Hz

DC Voltage Range 1 mV to 600V
Accuracy (0.7% of reading plus 2 counts)

Resistance Range 0.1 to 40.00 M
Best Accuracy \pm (0.9% of reading plus 1 count)

Capacitance Range 1 nF to 9999 μ F
Best Accuracy \pm (1.9% of reading plus 2 counts)

Continuity Beeper guaranteed on <20 , guaranteed off
>250 ;
detects opens or shorts of 250 μ s or longer

Hz Range Voltage Input: 5 Hz to 50 kHz
Current Input: 50 Hz to 5 kHz
Accuracy (0.1% of reading plus 2 counts)

General Specification:

" Surge Protection :6 kV peak per IEC 61010-1-95
" Fuse :11A, 1000V FAST Fuse, minimum
interrupt rating 17000A
" Temperature :Operating: -10°C to +50°C
:Storage: -30°C to +60°C
" Battery Life Alkaline: 300 hrs typical
" Size, with Holster (H x W x L) : 4.6 cm x 9.6 cm x 16.0 cm +
2 %
" Weight : Maximum 375 g
" Certifications required: UL (3111), , CSA, TÜV, (N10140)

Accessories to be supplied with Instrument:

Test lead set, Battery (installed), Protective holster and user
manual, calibration certificate traceable to national standard.

0C000155

: Digital Insulation Resistance Tester, similar to Make Megger,
Model: BM121 or Equivalent.
As per specification provided in Annexure - III
Make: Meggar/Fluke / Yokogawa / AVO International.



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ANNEXURE-III

SPECIFICATIONS OF DIGITAL INSULATION AND CONTINUITY TESTER

1. Product should have the following Features:

- " Should have single test voltage of 500 V avoids accidentally overstressing the insulation of the item under test.
- " Should automatically discharge the circuit under test
- " Should have visual warning of energized circuits above 25 V ac or V dc
- " Should have clear three digit liquid crystal display.
- " The continuity range should have maximum 0.01 Ohm resolution and a short circuit current in excess of 200 mA to meet the requirements of International Standards.
- " Should not have to press the test button when continuity testing for leaving both hands free.
- " Should be automatically switch-off after 5 minutes.
- " Should have battery low indication
- " Should have minimum 3 years warranty.

2. TECHNICAL SPECIFICATIONS:

Operations//Parameters// Range

Insulation Ranges// Nominal Test Voltage// 500 V
//Measuring Range //0,01 MOhm to 999 MOhm
//Short Circuit Current//2 mA
//Accuracy (at 20°C)// $\pm 3\%$ of reading ± 2 digits up to 10 MOhm, $\pm 5\%$ of reading ± 2 digits up to 100 MOhm , and $\pm 30\%$ of reading up to 999 MOhm

Continuity Range//Measuring Range (Should have autoranging)//
0,01 Ohm to 9,99 Ohm

10,0 Ohm to 99,9 Ohm

Open Circuit Voltage 5 V \pm 1 V d.c.

Short Circuit Current

210 mA for 0,01 Ohm to 9,99 Ohm range

21 mA for 10,0 Ohm to 99,9 Ohm range

Accuracy (at 20°C)

$\pm 3\%$ ± 2 digits for 0,01 Ohm to 9,99 Ohm range

$\pm 5\%$ ± 2 digits for 10,0 Ohm to 99,9 Ohm range



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	<p>3. General Specification:</p> <p>a) The instrument should have following Safety certificates " The instrument(s) meet the requirements for double insulation to IEC 1010-1 (1992), EN 61010-1 (1993) to Category III, 300 V phase to earth and 440 V phase to phase. " EMC : Should be in accordance with IEC61326 including Amendment No.1 " Installation Category: Should be for Category III: Fixed Wiring and installations within a building. " Overload Ratings: The instrument should withstand, if continuously connected to a 300 V phase to earth, 440 V phase to phase category III supply without damage. An overload of 720 V rms for 10 seconds should not cause damage to the instrument.</p> <p>b) Operating Temperature Range: -20°C to +60°C up to 100 MOhm and -20°C to +40°C over full range</p> <p>c) Power Supply: Should be 6 X 1,5 V cells or Nickel Cadmium rechargeable cells .</p> <p>d) Battery Life Typically more than 2000 tests each of 5 second duration.</p> <p>e) Weight: Should not more than 600 gm.</p> <p>f) The instrument should be supplied with User Guide, Test Leads, Carry Case</p>
0C000155	: Digital AC/DC Clamp meter, similar to make MEGGAR, Model: DCM2039 or equivalent As per specification provided in Annexure - IV Make: Meggar/ GMC Instruments / AVO International/ FLUKE.
	ANNEXURE-IV
	SPECIFICATIONS OF AC/DC TRUE RMS DIGITAL CLAMPMETER



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1. Product should have the following Features:
 - " The instrument should be capable of measuring up to 1000 A both AC and DC and should have an over-range capability of up to 2000 A. The size of jaw should be of minimum of 40mm.
 - " Should have features like the peak hold button and the frequency counter which will measure frequencies between 20 Hz and 10 kHz.
 - " Low Battery Indication should be in the instrument.

3. TECHNICAL SPECIFICATIONS:

AC. CURRENT Ranges 0 to 40 A, 0 to 400A and 0 to 1000 A
AC. CURRENT Accuracy $\pm(1,9\% \text{ rdg} + 8 \text{ digit}), 0 - 40 \text{ A}$
 $\pm(1,9\% \text{ rdg} + 7 \text{ digit}), 40 - 400 \text{ A}$
 $\pm(2,9\% \text{ rdg} + 5 \text{ digit}), 400 - 1000 \text{ A}$
AC. CURRENT Bandwidth 40Hz - 400Hz
AC. CURRENT Resolution Maximum 0.1 A
AC. CURRENT Conversion Type Average sensing RMS
indicating
DC CURRENT Ranges 0 to 40 A, 0 to 400A and 0 to 1000 A
DC CURRENT Accuracy $\pm(2,9\% \text{ rdg} + 8 \text{ digit}), 0 - 40 \text{ A}$
 $\pm(1,9\% \text{ rdg} + 4 \text{ digit}), 40 - 400 \text{ A}$
 $\pm(2,9\% \text{ rdg} + 5 \text{ digit}), 400 - 1000 \text{ A}$
DC CURRENT Resolution Maximum 0.1 A
FREQUENCY COUNT Ranges 20 Hz to 10 kHz
FREQUENCY COUNT Accuracy $\pm(0,5\% \text{ rdg} + 3 \text{ d})$
Display Min 4000 count LCD
Measuring Rate Times per second 2 T/sec
Type of Sensing Hall Effect (for a.c. & d.c.)
Over range indication "OL"
Auto Power 30 minutes non-use
Safety: Should be designed to IEC1010 -2-0321 kV Cat. III
Minimum measurable Conductor size dia. 51 mm
Minimum Jaw Opening 53 mm
Minimum measurable Busbar Size 24 x 60 mm
Power Requirement 9 V PP3 (IEC 6LR61)
Battery Life (Alkaline battery) Min 40 hrs
Size W x L x D in mm (106 x 240 x 40) + 3 %
Weight Max 450 g

3. General Requirement:

The instrument should be supplied with User Guide, calibration certificate, Test Leads, Case.



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0C000155	: Digital Earth Tester, similar to make: MEGGER, Model: DET 5/4 R or equivalent with accessories As per specification provided in Annexure - V Make : Meggar/Motowane / Waco

ANNEXURE-V SPECIFICATIONS OF DIGITAL EARTH TESTER

1. Product should have the following Features:

- " Should be simple, fully automatic one touch operation with direct reading of earth resistance.
- " Should have choice of three or four terminal measurement
- " Should have autoranging from 10 m Ω to 20 k Ω
- " Should tests to BS7671, BS7430, BS6651 and VDE 0413
- " Should have noise rejection to 40 V peak to peak.
- " The instrument should be in a small, lightweight case with a handle that has been designed for outdoor use and has IP54 protection
- " The measurement display should be on a large, clear 3 1/2 digit liquid crystal display.
- " Should have indication display for high test spike resistance and also when the noise interference is too high to take a valid reading. If the batteries need replacing or recharging this should also be shown on the display.
- " Should be automatically switched off to save battery power
- " Should have minimum 3 years warranty.

4. TECHNICAL SPECIFICATIONS:

FEATURE// RANGE// ACCURACY (at 23°C)
Earth Resistance Ranges (Autoranging)//

20 Ohm Range: 0.01 Ohm to 19.99 Ohm
200 Ohm Range: 0.1 Ohm to 199.9 Ohm
2 kOhm Range: 0.001 kOhm to 1.999 kOhm
20 kOhm Range: 0.01 kOhm to 19.99 kOhm// ± 2 % of reading ± 3 digits

Maximum service error// ± 5 % of reading ± 3 digits

Display//

3 1/2 digit L.C.D. with Ohm, kOhm and low battery voltage indicators. LEDs for high noise, high voltage probe resistance and



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	high current loop resistance// Test Frequency// 128 Hz \pm 0.5 Hz Test voltage// 50 V peak Test Current (constant current within a range)// 20 Ohm Range: 10 mA a.c. r.m.s. 200 Ohm Range: 1 mA a.c. r.m.s. 2 kOhm, 20 kOhm Range: 100 μ A a.c. r.m.s.
	3. General Specifications: a) Safety Standards required is IEC 1010-1 b) Electromagnetic Compatibility : In accordance with IEC61326 . c)Weight: Maximum (including batteries): 1.3 Kg maximum d) Power supply : Rechargeable version (12 V, 0,8 Ah) from 110/120 V or 220/240 V (user selectable) 50/60 Hz supplies . e)The instrument should be supplied with User Guide, calibration certificate, mains supply lead for charging, Four terminal Earth testing kit comprising carrying bag containing: Four spikes, hammer , 2 x 3 m, 30 m, 50 m on winders with connectors & clips, Reel of cable, 50 m (16 ft. approx.), Carry Case and Terminal Shorting bars (2).
0C000155	: Digital RCD Tester, similar to Make Meggar, Model Megger -LCB2500 or equivalent As per specification provided in Annexure - VI Make : Meggar/Motowane / Waco ANNEXURE-VI SPECIFICATIONS OF LOOP & RCD TESTER 1. Product should have the following minimum features: " The Loop and RCD tester should utilize advanced microprocessor technology. " The instruments should utilize a large LCD display with power saving LED backlight. The display should be mounted behind a highly resilient polycarbonate window for clarity, protection and viewing angle. " The instrument should be designed to perform all the live system tests required for an electrical installation which can meet



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in full the requirements of the 16th Edition Wiring Regulations, (BS 7671).

" In the event that the installed system has a fault or does not test as expected, a host of diagnostic features should be available to pinpoint the problem.

" When combined with software certification, the system should provide a highly professional image for the operator combined with the traceability of test results.

" The instrument should have comprehensive data storage options with individual test results being quickly stored with relevant connection details against user selectable distribution board and circuit references. Data storage should be contained within non-volatile memory (NVM), ensuring that test results are not lost in the event of battery failure or removal. Once stored, results should be able to recall for the display, print to an external serial printer or downloaded to suitable software. Download Manager for Windows® Operating systems is to be included in the supply enabling the simple download of stored data from the instrument into files on a PC. These files can be maintained as a record, used for manually completing certificates or exported to other applications such as spreadsheets and word processor documents. Instrument setups and printer language may also be changed.

" Where creation of certificates of test is required, instrument should be fully compatible with software for Windows, software for the creation of N.I.C.E.I.C. Certification alone.

" A choice of Non Tripping loop tests should be available such as:

i) Three wire 15 mA non tripping loop test with 0.01 Ohm

ii) Two wire 15mA non-tripping loop test with 0.1 Ohm resolution

" No neutral should be needed for Line to Earth Testing.

" Automatic Test should start once armed. The instrument should wait until the probes are connected or voltage is turned on and then automatically start a test.

" Should be capable for Three Phase Tests: Phase-Phase measurements (up to 440 V), Phase- Neutral and Phase-Earth tests.

" The instrument should be supplied with a pre-wired plug for making connections via the standard socket outlets and a three wire lead set with probes and clips.

" The instrument should be easily set to test General purpose, Selective or DC sensitive RCDs.

" The instrument should be suitable for programmable RCDs by allowing the test current to be precisely defined up to 1000 mA.



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- " The instrument should indicate the Contact Voltage.
- " Should have feature of auto-Sequencing of RCD, enabling the operator to remain with the RCD in order to reset it whilst the instrument automatically cycles through the necessary tests.
- " Should have feature of RCD Ramp Test to indicate the actual tripping current and which automatically increases the test current until the RCD trips. At this point the actual tripping current should be displayed.
- " Should include a special phase rotation symbol within the LCD display.
- " Should be supplied with manufacturer's warranty of minimum three years.

2. TECHNICAL SPECIFICATIONS:

SUPPLY VOLTAGE: Instruments should be designed to work on supplies of 110 - 440 V, 50/60 Hz, overvoltage Category III with a maximum voltage to Earth of 300 V.

Supply Voltage Measurement: 25 - 500 V, Intrinsic accuracy: $\pm 2\%$ ± 2 digits

Supply Frequency Measurement: 16 - 460 Hz, Intrinsic accuracy: $\pm 0,1\%$ ± 1 digit

LINE to EARTH LOOP RESISTANCE MEASUREMENT (to EN 61557-3)

Display Range: 0.01 Ohm to 3.00 kOhm,

Supply Range: 100 - 280 V, Nominal Supply: 230 V, 50 Hz

EN61557 Operating Range: 0.25 Ohm to 3.00 kOhm,
Intrinsic accuracy: 0.01 Ohm - 9.99 Ohm $\pm 4\%$ ± 0.03 Ohm,
10.0 Ohm - 89.9 Ohm , $\pm 5\%$ ± 0.5 Ohm
90 Ohm - 899 O $\pm 5\%$ ± 5 Ohm
900 Ohm - 3.00 kOhm $\pm 5\%$ ± 20 Ohm

LINE - LINE (Phase/Phase) LOOP RESISTANCE MEASUREMENT (to EN 61557-3)

Display Range: 0.01 Ohm to 19.99 Ohm, Supply Range:

100-440V Phase to Phase, Nominal Supply:

230 V, 50 Hz, EN61557 Operating Range: 0.25 O to 19.99 Ohm,
Intrinsic accuracy: $\pm 5\%$ ± 0.03 Ohm

LINE - EARTH LOOP RESISTANCE MEASUREMENT AT 15 mA (to EN 61557-2) ,

a) For Loop L-PE 0.10:



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Display Range: 0.1 Ohm to 2.00 kOhm, Nominal Supply: 230 V 50 Hz,

EN61557 Operating Range: 5.0 Ohm to 2.00 kOhm, Intrinsic accuracy: up to 200 Ω $\pm 3\% \pm 0.3 \Omega$ over 200 Ohm $\pm 5\% \pm 5 \Omega$ Noise Immunity: 1 Ohm of reading within 0.3 Ohm on a normal domestic supply.

b) For Loop L-PE 0.01 Ohm:

Displayed Range: 0.01 Ohm to 10.00 Ohm, EN61557 Operating Range: 0.5 Ohm to 10.00 Ohm, Nominal Supply:

230 V 50 Hz, Intrinsic accuracy: $\pm 5\% \pm 0.05 \Omega$, Noise Immunity: 1 Ohm of reading within 0.05 Ohm on a normal domestic supply

RCD TESTING (to EN61557-6 up to 500 mA)

Selectable Ranges: 30, 100, 300, 500, 1000 mA, Variable Range: 10 mA to 1000 mA,

Test Facilities: a) Contact voltage tests at 1/2 I, b) Delta n Loop resistance tests at 1/2 I, c) ?n, d) No Trip tests at 1/2I Delta n, e) Trip tests at I Delta n, 5I Delta n, f) Fast Trip test at 150 mA, g) Ramp tests

RCD Types: General purpose, delayed (Selective) and d.c. Sensitive

Nominal Supply: 230 V, 50 Hz, Supply Range: 100 - 280 V, 45 - 65 Hz

1/2I Delta n TEST CONTACT VOLTAGE

Displayed range: 0 V to 90 V, Measurement range: 5 V to 90 V

LOOP RESISTANCE (measured at 1/2 I Delta n)

I Delta n// RESOLUTION

10hm //0.5 kOhm to 9 kOhm

30 //170 Ohm to 3 kOhm

100 //50 Ohm to 900 Ohm

300 //17 Ohm to 300 Ohm

500 //10 Ohm to 180 Ohm

1000 // 5 Ohm to 90 Ohm

2 SECOND NO TRIP TEST at 1/2 I Delta n (optional)

Test current duration: 2 seconds, Intrinsic Test Current accuracy: -8% to -2%

TRIP TESTS: I ?n Trip Test Automatic 1/2 Delta n test, followed by a 30 second delay (Selective type only) then a Trip test.

a) General purpose Test: On test for up to 300 ms b) Selective Test: Delta n test for up to 2000 ms

D.C. Sensitive Trip (For RCDs up to 300 mA): As the I Delta n Trip Test above, but test current is a half wave rectified a.c.with an r.m.s. value of $\sqrt{2}$ Delta n.



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5I Delta n Trip Test (for RCDs up to 100 mA): Test follows the same sequence of 1/2I Delta n test, 30 second delay (Selective type only) as the I Delta n test.

General purpose test: 5I Delta n test for up to 40 ms, b) Selective test: 5I Delta n test for up to 150 ms

TIMED TRIP TESTS

Trip time displayed Range: 0.1 ms to test time limit, Intrinsic Trip time accuracy: $\pm 1\% \pm 1$ ms

Intrinsic Test Current accuracy: 2% to +8%

Ramp Test (Trip current measurement) Automatic 1/2 I Delta n test followed by a 30 second delay (Selective type RCD only) then an incremental ramp test.

Intrinsic Ramp Test Current accuracy: $\pm 3\%$

I Delta n// RAMP RANGE //INCREMENT

10 //5 - 15 mA // 1 mA

30 //15 - 50 mA // 1 mA

100 //50 - 150 mA// 2 mA

300 //50 - 300 mA// 6 mA

500 //250 - 500 mA// 10 mA

1000 //500 - 1020 mA// 52 mA

150 mA 40 ms Trip Test: Stand alone test at 150 mA for 40 ms, Displayed Range: 0.1ms to 40ms

POWER SUPPLY: 6 x 1,5 V Alkaline cells type LR6 or 1,5V nickel cadmium rechargeable cells.

FUSES: 2 x 7 A

Safety: a) Should Complied with the following parts of EN61557, Electrical safety in low voltage systems up to 1000 V a.c. and 1500 V d.c. - Equipment for testing, measuring or monitoring of protective measures:- Part1 - General requirements, Part 2 - Loop resistance, Part 3 - Residual current, devices (RCDs), Part 10 - Combined Measuring Equipment.

b) Should meet the requirements for double insulation to IEC61010-1 (1995), EN61010-1 (1995) Safety Requirements for electrical equipment for measurement, control, and laboratory use. Category III, 300 Volts phase to earth (ground) and 440 Volts phase to phase, without the need for separately fused test leads.

Electromagnetic Compatibility: Should complied with IEC 61326-1 Environmental Conditions:

Operating range: -5 to +40°C, Operating humidity: 90% RH at 40°C max., Storage temperature range: -25 to +65°C, Calibration Temperature: +20°C, Maximum altitude: 2000 m, Dust and water protection: IP54



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	Physical Specifications Dimensions: Height: max 240 mm , Width: max 125 mm, Depth: max 70 mm , Weight: max 950 g (including batteries).
	3. General Requirement:
	(a) The instrument should be supplied with User Guide, 3-Wire Test Lead Set, 2Prods, 3 clips, Carry Case, Download Manager Software on CD, Mains Plug Test Lead, Software for Windows, Certification software for producing NICEIC certificates, Printer Serial lead, Fused Probe and Clip Set, Computer Serial Lead
0C000155	: Digital Cable height meter, similar to Make -Megger, Model: CHM600 or equivalent As per specification provided in Annexure - VII Make: Meggar/GMC Instruments / AVO International.

ANNEXURE-VII

SPECIFICATIONS OF CABLE HEIGHT METERS

1. Product should have the following Features:

- " The instrument should be able to measure cable heights of: Telephone lines, Distribution lines, Transmission lines, Cable television, Street lights, Sag (lowest point to ground), Separation between up to six cables.
- " Additionally the Cable Height Meters should be able to check whether the device has remained in calibration since its purchase date.
- " Should be simple, easy to use to ensure fast and effective measurements with a minimum of operator training.
- " Should be light weight and have hand-held portability for easy transportation and multiple measurements.
- " No physical connection to cables or wires should be required to obtain measurement.
- " Should show the battery warning symbol when the battery voltage falls to approximately 6 volts.
- " Should have automatic power off feature to conserve battery power when idle for three minutes.



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	" Should have pre-selectable measuring modes, either meters or feet and inches for universal use.
	2. Technical Specification:
	" Range: 10 to 50 ft (for minimum 1.00 in cable dia) 10 to 50 ft. (for minimum 0.50 in cable dia) 10 to 39 ft. (for minimum 0.25 in cable dia) 10 to 32 ft. (for minimum 0.125 in cable dia)
	" Resolution: 1/4 in. (5 mm) if < 10 m, 1/2 in. (10 mm) if > 10 m
	" Accuracy: Typically less than 0.5% error ± 2 digits
	" Power source: 9 volt alkaline leak-proof battery (shall be included in the supply)
	" Operating Temperature: 14° F to 104° F (-10° C to 40° C) with compensation over the full range.
	" Battery Life: 50,000 Measurements
	" Dimensions: Maximum (70 H x 100 W x 205 D) mm
	" Weight: maximum 0.75 kg
	3. General Requirement: The instrument shall be guaranteed for a period of minimum three years from the date of receipt against any manufacturing defect or workmanship. After- sales service from the manufacturer/ dealer shall be available beyond guarantee period. Guarantee certificates should be properly stamped & signed and user's manual shall be sent along with the supply.
0C000155	: AC Current -Clamp Meter similar to Make: FLUKE, Model: i1000s or equivalent As per specification provided in Annexure - VIII Make: Meggar/ GMC Instruments / AVO International.

ANNEXURE-VIII

SPECIFICATIONS OF AC CURRENT CLAMP

1. Product should have the following Features:

- " Should allow accurate measurement of currents from 100 mA to 1000 A rms, 5 Hz to 100 kHz without breaking into the circuit.
- " Should be ideal for measuring distorted current waveforms



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	and harmonics. " Should have a passive filter to eliminate noise and ring on rapidly rising di/dt wave-form, ensuring accurate screen displays. " Should be connected directly to an FLUKE make with digital multimeters (DMMs). " Should be safety rated for 600 V on ac circuits of Overtoltage Category III. " Minimum one year warranty.
	2. Specifications and Compatibility
	Mechanical Specifications: Max cable// Dimensions //Weight// IP Rating 2.13" (54mm)// 4.37 x 8.5 x 1.77 in. 111 x 216 x 45 mm// 1.21 lbs / 550g IP 40 (IEC 529
	Electrical Specifications: Switch Position// Input Range/ Accuracy* 100mV/A //100mA-10A (20A instantaneous peak)// 3% 10mV 10mV/A //100mA-100A (200A instantaneous peak)// 2% 5mV 1mV/A //1A-1000A (2000A instantaneous peak)// 1% 1mV
	3. General Specifications: The instrument should be supplied with User Guide, calibration certificate traceable to national standard, reinforced coaxial cable, an insulated BNC connector, BNC to banana jack adapter.
0C000155	: Earth Leakage Clamp Meter, similar to Make: Meggar, Model: DCM 300E or equivalent As per specification provided in Annexure - IX Make: Meggar/ GMC Instruments / AVO International.

ANNEXURE-IX

SPECIFICATIONS OF DIGITAL EARTH LEAKAGE CLAMPMETER

1. Product should have the following Features:



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Head Code/Sub Code/Sub Sub
Code/ Material No.

Description

- " Should have 40 mm jaw size.
- " Should have analogue Bargraph & Digital Display
- " The instrument should have four ranges; 30 mA, 300 mA, 30 A and 300 A with a minimum resolution of 0.01 mA on the 30 mA range.
- " Should have data hold feature to aid measurement.
- " Should have automatic power off feature to save battery life
- " Should be designed in accordance with safety standards EN61010-2-32 and EMC.

5. TECHNICAL SPECIFICATIONS:

Parameters	Range
Measuring Method :	Dual integration mode
Measuring Function:	Leakage current and load current
Display:	3.5 digit L.C.D.; max. reading of 3200
Range:	0-30 mA/300 mA/30 A/300 A (50/60Hz)
Ranging:	2 manual ranges
Accuracy specified at operating temperature:	23°C ± 5°C, 80% RH max.
Accuracy:	±1,2% rdg ±5 dgt for 0-200 A ±3.0% rdg ± 5 dgt for 200-250 A ±5.0% rdg ± 5 dgt for 250-300 A
Resolution:	Max 0.01 mA for 30 mA range Max 0.1 mA for 300 mA range Max 0.01 A for 30 A range Max 0.1 A for 300 A range
Jaw Opening Capability:	Min 40 mm
Over Range Indication:	"OL" mark on L.C.D.
Maximum Indication:	3200
Low Battery Indication:	2.5 V - 2.7 V; "+" mark on L.C.D.
Data Hold Indication:	"DH" mark on L.C.D.
Sampling Time:	Approx. 2 times/sec. (digital display)
Approx. (bargraph display)	12 times/sec.
Auto Power Off:	The meter is set to power off mode approx. 10 minutes after the power switch on



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Description

Limitation of Circuit Voltage: Less than a.c. 600 V
Withstanding Voltage: a.c. 3700 V/1 minute max. (between the core of CT and the unit housing)
Operating Temperature: 0 - 40 °C <80% RH(non-condensing)
Storage Temperature: -10 - 60 °C <70% RH(non-condensing)
Power Supply: 2 x 1.5 V button cells LR44 or SR 44
Power Consumption: Approx. 5 mW
Battery Life: Approx. 50 hrs. (LR44)
Size: Maximum 70 (W) x 185 (H) x 30 (D) mm
Weight: Maximum 130 g
Safety EN61010-1 and phase to phase CAT III or 600 V
CAT II double insulated EN61010-2-032 300 V phase to earth and 500 V
EMC
In accordance with IEC61326 including amendment No.1.
Warranty Minimum one year

3. General Specifications:

The instrument should be supplied with User Guide, Carry Case, and calibration certificate traceable to national standard.

Common Note.

Common Note.

Description / Material Codes