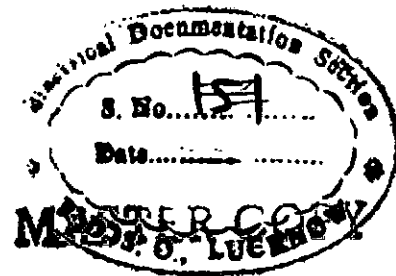


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SPEC. NO. E-16/17

SPEC. FOR HARMONIC ANALYSER
WAVE FORM ANALYSER

164383

1980

(61)

E-16/17

Government of India
Ministry of Railways
Research, Designs & Standards Organisation
Manak Nagar/Lucknow-11.

Specification No.E-16/17.

SPECIFICATION FOR HARMONIC ANALYSER (WAVE FORM ANALYSER).

1. Scope:

1.1 The instrument should be able to measure and print out -

(i) Harmonic spectrum of power frequency voltage and current upto 50th harmonic.

(ii) Return current harmonics in chopper controlled dc EMU/AC locomotives, (25KV-50Hz)

(iii) RMS, average, peak, frequency, phase angle, real/apparant/reactive power of current of voltage. The result should also be suitably displayed on CRT like bar graph, display of wave-form etc.

2. Power Supply:

The instrument should operate either on ac or dc whichever is available as under :

(i) AC Supply - $230 \pm 15\%$, 50 Hz $\pm 10\%$.

(ii) DC Supply - 110V dc $\pm 10\%$.

3. Operating condition and climate:

(i) Ambient temp. and storage temp. = 0°C to 70°C .

(ii) Maximum relative humidity = 100%.

(iii) Shocks & Vibrations : Conforming to the specification No.IEC-77 of IEC-571.

4. Technical Details:

(i) No. of channels : 2 Differential inputs for voltage and 2 for current.

(ii) Max. voltage/Range : 440V ac/in (mV to V).

(iii) Max. current/Range : 100A/in (mA to A).

(iv) Harmonics : Upto [REDACTED] harmonics.

- (v) Measurement of psophometric current.
- (vi) Measurement of band width.
- (vii) Resolution - 12 bit.
- (viii) Measurement of average, rms, max/min. value, frequency, phase angle, real-reactive - apparent powers of voltage and/or currents.
- (ix) Instrument should be able to work satisfactorily in laboratory, sub-station as well as on ac/dc locomotive (25 KV AC/1.5 KV dc) from standstill position to the speed of 200 km/hr.

5. Miscellaneous:

Instrument should be provided with 3 copies of each of the following

- (i) Full technical details of system.
- (ii) Operation manual with schematic circuits and drawings.
- (iii) List of spares.

6. Warranty:

One year for replacement of any part or sub-assembly/Assembly free of cost.

7. Guarantee:

3 years for satisfactory servicing.

8. Demonstration:

For functioning of instrument should be arranged at RDSO, Lucknow.

9. Training:

Necessary training to 2 Engineers should be provided by the tenderer at their works for 3 weeks before the system is installed/commissioned at site free of cost.

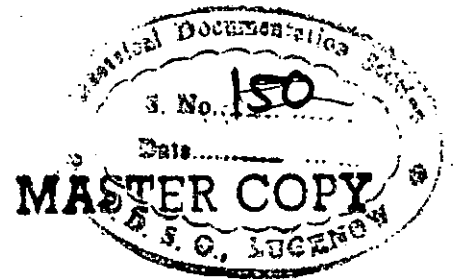
10. Inspection & Testing:

Inspection and tests shall be carried out to ensure that all the requirements of this specification are complied with at tenderers premises.

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SPEC. No. E-16/16



SPEC. FOR PORTABLE AC/DC
ELECTRIC POWER/DEMAND ANALYSER
 x x

164385

1988

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Government of India
Ministry of Railways
Research, Designs & Standards Organisation
Manak Nagar/Lucknow-11.

E-
Specification No. 46/16.

SPECIFICATION FOR PORTABLE AC/DC ELECTRIC POWER/DEMAND ANALYSER

1. Scope:

The instrument should be able to continuously monitor/measure, analyse and print the electrical parameters. It should be capable of doing following tasks :

- i) Analysis of electric energy and demand usage.
- ii) Development of electric energy management programme.
- iii) Continuous monitoring of energy consumption at sub-station dc/ac electric locomotives/EMUs and during laboratory tests.
- iv) It should also be able to measure, display and print simultaneously - (AC/DC) voltage/current, power-factor, KW, KWH, KVAR, KVA, frequency, time (mS, S, Min. hour, day, month, year and date).
- v) It should be possible to connect to DC, AC single phase 3-phase and pulse generating system.
- vi) Communicate the load data for use by a remote computer.
- vii) It should have built-in auto calibration, auto-ranging with overload indication, audio-visual.
- viii) The system should have security lock arrangement to prevent unauthorised handling.
- ix) Print-out should be clear and legible in English language.

2. Power Supply:

The instrument should operate either on ac or dc whichever is available as under :

- (i) AC Supply - $230V \pm 15\%$, $50 \text{ Hz} \pm 10\%$
- (ii) DC Supply - $110V \text{ dc} \pm 10\%$

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3. Operating condition and climate:

- (i) Ambient temp. and storage temp. = 0°C to 70°C .
- (ii) Maximum relative humidity = 100%.
- (iii) Shocks & Vibration = Conforming to the specification
No. IEC-77 of IEC-571.
- (iv) Atmosphere = Dusty and ~~Saline~~ Saline.

4. Technical Details:

(i) Voltage AC/DC:

Vac = 50V to 500V, 50 Hz, 1 ϕ , 3 ϕ .

V dc = 50V to 1500V.

(ii) Current AC/DC:

I ac = 0 to 10A, 50 Hz, 1 ϕ , 3 ϕ .

I dc = 0 to 10A.

- (iii) Power Factor - Range - lag 0.1 - Unity- 0.1 lead.
- (iv) Frequency - 0 Hz to 500 Hz on direct digital display.
- (v) Time Range - (ms, S, Min, hr., day, month, year & date)
- (vi) Sensitivity to pulse duration upto 0.1 ms.
- (vii) Leakage current should not be more than 0.01 mA.
- (viii) Its overall accuracy should not be less than 0.01%.
- (ix) The following CTs/PTs should be supplied along with the equipments :

(i) PT. ratio 25 kV/110 V.

(ii) CT. ratio 200 A, 100 A/5A.

5. Miscellaneous:

Instrument should be provided with 3 copies of each -

- (i) Full technical details of system.
- (ii) Operation manual with schematic circuits and drawings.
- (iii) List of spares.

6. Warranty:

One year for replacement of any part or sub-assembly/Assembly free of cost.

7. Guarantee:

3 years for satisfactory servicing.

8. Demonstration:

For functioning of instrument, should be arranged at RDSO, Lucknow.

9. Training:

Necessary training to 2 Engineers should be provided by the tenderer at their works for 3 weeks before the system is installed/commissioned at site free of cost.

10. Inspection & Testing:

Inspection and tests shall be carried out to ensure that all the requirements of this specification are complied with at tenderers premises.

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