



**SAVITRIBAI PHULE PUNE UNIVERSITY
DEPARTMENT OF PHYSICS**

Ref. No./Quot./PHY/RCK/02

Date: 05/05/2026.

Name of the Administration

Branch/Department:

Quotations are invited for the supply of the following goods/carrying out the work, to reach this office on or before

25/05/2026

Sr. No.	Description of Material/Item/work	Approximate Quantity	Rate Per unit	Amount (Rs.)	Remark
1.	Ferroelectric Hysteresis Loop Tracer and Strain Measurement System.	1 No			

1. Octroi Exemption Certificate will be issued for the goods supplied from places outside the Pune Municipal Corporation Limits.
 2. Excise duty, Custom duty Exemption Certificate will be issued if applicable.
- Note: For other terms and conditions, see overleaf.

Head, Department of Physics

Administrative Branch

Savitribai Phule Pune University

Pune - 411 007.

Soltale
Head
Department of Physics
Savitribai Phule Pune University
Pune - 411 007.

Signature

(Supplier)

(With Stamp)

TERMS AND CONDITIONS

1. Mention quotation No on the envelope.
2. Quote rate per unit and date of validity. Date of Validity should be a minimum of 60 days from the last date of submitting the quotation.
3. Submit a sample/Catalogue of the material with a quotation if necessary.
4. Quotation must be sent along with the covering letter on your letterhead, quoting your sales tax Registration number.
5. Conditional quotation will not be accepted.
6. Delivery within Days from the date of order at the Physics Department of the Savitribai Phule Pune University.
7. Work/Installation to be completed within Days from the date of the order of the Savitribai Phule Pune University
8. Quotation will be rejected in case of even a single correction or overwriting. Only clear and uncorrected quotations will be accepted.
9. Payment as per actual measurements wherever applicable.
10. Payment will be made by the online system only.
11. Income tax will be deducted as per the prevailing rule.
12. Water charges 2% will be recovered, if used.
13. GST tax deducted as per GST rules.
14. In case of works and service contracts, the Security Deposit will have to be deposited by the contractor in the following manner:
 - (a) 2.5% before commencing the work.
 - (b) 2.5% will be deducted from the R.A. Bill.
15. Electricity charges will be recovered as per the rules if used.
16. Savitribai Phule Pune University will issue the Octroi Exemption Certificate, if applicable.
17. An excise duty exemption Certificate/Sales Tax form will be issued, if applicable.
18. Rates quoted should be Inclusive of all taxes with Tax details e.g. Excise duty, Custom duty, Sales tax, packing and forwarding, etc.
19. The above terms and conditions are acceptable.

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Head
Department of Physics
Savitribai Phule Pune University
Pune - 411 007

Signature of the Supplier/Contractor
(With Stamp)

Ferroelectric Loop Tracer and Strain Measurement System

Department of Physics, Savitribai Phule Pune University

Technical Specifications

1. System Overview

Integrated system for electrical (P-E, I-E) and mechanical strain (S-E) characterization of ferroelectric and piezoelectric materials with synchronized data acquisition. Provision for magnetoelectric (M-E) measurement may be included as an optional/preferred add-on module, compatible with the base system for future multiferroic studies.

2. Electrical Measurement

- Output Voltage: **± 5 kV or higher**
- Output Current: **≥ 10 mA**
- Slew Rate: **≥ 50 V/ μ s**
- Maximum Electric Field: **up to ≥ 100 kV/cm (sample dependent)**
- Frequency Range: **0.1 Hz to ≥ 1 kHz (voltage dependent)**
- Waveforms: **Sine, Triangle, Square, Pulse, Arbitrary**
- Charge Resolution: **≤ 50 fC**
- Charge Range: **≥ 250 μ C**
- Polarization Accuracy: **$\pm 1-2\%$**
- Current Measurement Range: **pA to mA**
- Fatigue Testing Capability: **$\geq 10^6$ cycles**

3. Strain Measurement (LVDT-Based)

- Measurement Type: **LVDT-based displacement/strain measurement**
- Displacement Range: **± 10 μ m (expandable up to ± 50 μ m)**
- Resolution: **≤ 50 nm**
- Bandwidth: **up to ≥ 1 kHz**
- Capability: **S-E (butterfly loop) measurement synchronized with electrical measurements**

4. Magneto-Electric (M-E) Coupling (Optional / Preferred)

- Provision for **magnetoelectric coupling measurements** (optional/preferred)
- Compatibility with **external electromagnet (up to ≥ 1 Tesla)**
- Programmable magnetic field control (if supplied)
- Measurement capability: **induced voltage/charge under magnetic excitation**
- Method: **Lock-in amplifier based measurement (lock-in amplifier to be provided by user)**
- System compatibility for **in-situ measurements under applied magnetic field**

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5. Software

- Real-time visualization of **P-E, I-E, S-E (and M-E if available)**
- Automated extraction of **Pr, Ps/Pm, Ec (and ME parameters if applicable)**
- User-defined measurement protocols
- Data export in **CSV, TXT, and Origin-compatible formats**

6. General Features

- Sample Types: **Bulk ceramics, pellets, thin films**
- Temperature Option: **Room temperature to $\geq 200^{\circ}\text{C}$ (optional/preferred)**

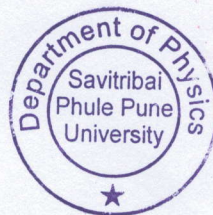
7. Safety

- High-voltage interlock system with **emergency stop**
- Over-voltage and over-current protection
- Automatic discharge provision
- Thermal protection (for magnet, if applicable)

8. Warranty

- 1 years comprehensive warranty with installation and training

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Sarkale
Head
Department of Physics
Savitribai Phule Pune University
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