Standard Operating Procedure (SOP)

Calibration and Verification of Machine Settings and Parameters

Purpose:

This SOP details the procedures for the **calibration and verification of machine settings and parameters** to ensure accurate and consistent equipment performance. It covers step-by-step guidelines for setting up calibration, tools required, verification methods, frequency of checks, documentation, and corrective actions to maintain optimal machine functionality and product quality. The purpose is to minimize errors, reduce downtime, and uphold safety and efficiency standards in all operational processes.

1. Scope

This procedure applies to all machines requiring periodic calibration and verification of operational settings and parameters within the facility.

2. Responsibilities

- **Maintenance Technician/Engineer:** Carry out calibration and verification as per SOP.
- **Quality Assurance:** Review records, verify process outcomes, and ensure compliance.
- **Supervisors:** Schedule calibration activities and maintain documentation.

3. Tools and Equipment Required

- Calibrated measuring instruments (e.g., multimeter, gauge blocks, calipers)
- Manufacturer's calibration kits or software
- Standard reference materials
- Personal Protective Equipment (PPE)
- Calibration log sheets

4. Calibration Procedure

1. Ensure the machine is in a safe state (powered down and locked out if applicable).
2. Review manufacturer's calibration instructions and SOPs.
3. Gather required tools and calibration standards.
4. Power on the equipment (if required), and allow it to warm up as specified by the manufacturer.
5. Connect calibration tools following safety protocols.
6. Adjust machine settings as per calibration standard/reference.
7. Record the actual values and set points in the calibration log sheet.
8. Repeat the process for all settings/parameters as per the checklist.
9. Restore machine to operational state after calibration.
10. Label the equipment with the calibration status and due date for next calibration.

5. Verification Methods

- Run test cycles to ensure settings match specified parameters.
- Use reference/test samples and measure output against known standards.
- Compare machine readouts against calibrated instruments.
- Document variances and corrective measures if needed.

6. Frequency of Calibration and Verification

- As per manufacturer's recommendation.
- After maintenance or repairs.
- At set intervals (e.g., monthly, quarterly, annually) based on operational requirements.
- Whenever inaccuracies are suspected.

7. Documentation

- Complete and sign calibration log sheets after each activity.

- Maintain records of equipment, calibration dates, and results.
- Archive documentation for audits and quality assurance reviews.
- Use the sample log format below:

Date	Machine ID	Parameter	Standard Value	Measured Value	Technician	Status	Remarks
YYYY-MM-DD	ABC123	Temperature	100Â°C	99.8Â°C	J. Doe	Pass	Within tolerance

8. Corrective Actions

- Identify and document discrepancies exceeding tolerance limits.
- Perform troubleshooting and necessary adjustments or repairs.
- Re-calibrate and verify the machine before resuming operation.
- Notify supervisors and QA for follow-up if repeated deviations occur.

9. Safety Precautions

- Always use appropriate PPE when handling equipment.
- Follow lockout/tagout (LOTO) procedures where applicable.
- Be aware of electrical and mechanical hazards during calibration and verification.

10. References

- Manufacturer's operation and calibration manuals
- Internal quality management system documentation
- Regulatory and industry standards

11. Revision History

Version	Date	Summary of Changes	Approved By
1.0	YYYY-MM-DD	First issue	Name/Signature