



Learn Beyond

**KPR Institute of
Engineering and
Technology**

(Autonomous, Affiliated to Anna University)

**KPR Center for Biomedical
Equipment Testing and Calibration**

Infusion Pump Calibration

Device: IDA-1S Infusion Device Analyser

DUT: _____

Objective: To collaboratively calibrate and verify the accuracy of an Infusion Pump / Syringe Pump against set parameters, adhering to safety and procedural standards.

Pre settings: Make sure the analyzer and the DUT is prepared and set ready for testing.

Infusion Pump Calibration

Pump Details: Model: _____ Serial No.: _____

Test Fluid: Distilled Water / Normal Water

Test Point	Parameter to Set on Pump	Measurement from IDA-1S	Calculation % Error = $\frac{[(\text{Measured} - \text{Set}) / \text{Set}]}{100}$	Pass/Fail (Tolerance ±5%)
1. High Flow Rate	Rate: 100 mL/hr Volume to Deliver: 50 mL	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
2. Medium Flow Rate	Rate: 10 mL/hr Volume: 5 mL	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
3. Low Flow Rate (Critical Care)	Rate: 5 mL/hr Volume: 2.5 mL	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
4. Occlusion Pressure Test	Set to 10 mL/hr . IDA-1S in Pressure Mode. Gradually occlude line.	Max Pressure Observed: _____ mmHg (Pump should alarm)	Spec: Typically > 500 mmHg	[] Pass [] Fail

Team Observations & Troubleshooting Notes:



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Post-Calibration Analysis & Reporting (For Both Teams)

Data Analysis: Did any test point fail? If yes, what could be the potential causes?

- 1.
- 2.
- 3.
- 4.

Error Sources: List three potential sources of error in this calibration process.

- 1.
- 2.
- 3.

Clinical Significance: Why is low-flow rate accuracy (e.g., 1-5 mL/hr) especially critical for syringe pumps?

- 1.
- 2.
- 3.

Team Handover & Summary:

- Pump type tested:
- Overall result (All Pass / Fail at X rate):
- One key challenge faced and how it was resolved:



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Pump Details: Model: _____ Serial No.: _____

Test Fluid: Distilled Water / Normal Water

Test Point	Parameter to Set on Pump	Measurement from IDA-1S	Calculation % Error = $\frac{[(\text{Measured} - \text{Set})]}{\text{Set}} \times 100$	Pass/Fail (Tolerance $\pm 5\%$)
1. High Flow Rate	Rate: 150 mL/hr Volume to Deliver: 50 mL	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
2. Medium Flow Rate	Rate: 15 mL/hr Volume: 5 mL	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
3. Low Flow Rate (Critical Care)	Rate: 5.5 mL/hr Volume: 2.5 mL	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
4. Occlusion Pressure Test	Set to 15 mL/hr . IDA-1S in Pressure Mode. Gradually occlude line.	Max Pressure Observed: _____ mmHg (Pump should alarm)	Spec: Typically > 500 mmHg	[] Pass [] Fail

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Data Analysis: Did any test point fail? If yes, what could be the potential causes?

- 5.
- 6.
- 7.
- 8.

Error Sources: List three potential sources of error in this calibration process.

- 4.
- 5.
- 6.

Clinical Significance: Why is low-flow rate accuracy (e.g., 1-5 mL/hr) especially critical for syringe pumps?

- 4.
- 5.
- 6.

Team Handover & Summary:

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Syringe Pump Calibration

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Pre settings: Make sure the analyzer and the DUT is prepared and set ready for testing.

Syringe Pump Calibration

Pump Details: Model: _____ Serial No.: _____

Test Fluid: Distilled Water / Normal Water

Test Point	Parameter to Set on Pump	Measurement from IDA-1S	Calculation $\% \text{ Error} = [(\text{Measured} - \text{Set}) / \text{Set}] \times 100$	Pass/Fail (Tolerance $\pm 5\%$)
1. Standard Rate	Rate: 20 mL/hr Volume to Deliver: 10 mL	Measured Flow: _____ mL/hr Total Volume: _____ mL	%Error: _____ %	[] Pass [] Fail
2. Low Flow Rate	Rate: 5 mL/hr Volume: 2.5 mL	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
3. Very Low Flow (Neonatal)	Rate: 1 mL/hr Volume: 0.5 mL *Use IDA-1S's most sensitive mode*	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
4. Bolus Function Test	Program a 2 mL Bolus over 2 minutes.	Measured Bolus Volume: _____ mL Time Taken: _____ min:sec	Volume Accuracy: _____ %	[] Pass [] Fail

Team Observations & Troubleshooting Notes:



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1. Standard Rate	Rate: 29 mL/hr Volume to Deliver: 10 mL	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
2. Low Flow Rate	Rate: 8 mL/hr Volume: 2.5 mL	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
3. Very Low Flow (Neonatal)	Rate: 1.5 mL/hr Volume: 0.5 mL *Use IDA-1S's most sensitive mode*	Measured Flow: _____ mL/hr Total Volume: _____ mL	% Error: _____ %	[] Pass [] Fail
4. Bolus Function Test	Program a 5 mL Bolus over 1 minutes .	Measured Bolus Volume: _____ mL Time Taken: _____ min:sec	Volume Accuracy: _____ %	[] Pass [] Fail

Team Observations & Troubleshooting Notes:

Post-Calibration Analysis & Reporting (For Both Teams)

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