

Ruler or Caliper (Linear Measurement) Parallax Error: If the measurement is read at an angle, rather than straight-on, the reading can be distorted due to the displacement of the scale from the observer's perspective. Micrometer (Precise Linear Measurement) Over-tightening or Under-tightening: If the micrometer's spindle is turned too tightly, it can compress the object being measured, leading to an inaccurate reading. Digital Thermometer (Temperature Measurement) Calibration Error: A thermometer may not be calibrated correctly, leading to inaccurate temperature readings. To minimize these errors, it's important to use the tools correctly, calibrate them regularly, and ensure environmental conditions are stable when measuring. Zero Error: If the ruler or caliper is not properly aligned at the starting point (zero) or there is a slight misalignment when measuring, it could introduce an offset error. Misalignment: If the object is not placed correctly between the micrometer's anvil and spindle, it can result in an inaccurate measurement. Zero Error: Micrometers, especially manual ones, can have a zero error if they are not calibrated correctly when fully closed, which can result in a consistently incorrect measurement. Over time, electronic components may drift, causing the thermometer to display incorrect values. Example: If the thermometer was originally calibrated at a factory setting but has been exposed to temperature extremes, it might give readings slightly off from the actual temperature. Contact Error (Thermocouple/Probe): The thermometer probe may not be in full contact with the object or fluid being measured, causing it to read inaccurately. Common Errors Across All Tools: Human Error: Incorrect reading, misplacement of the tool, improper handling, or failure to follow correct procedure can lead to measurement inaccuracies. Environmental Factors: Temperature, humidity, or even vibrations can sometimes affect measurements, especially when precision is critical. Example: Misreading the measurement on a ruler with small divisions can lead to errors. Ambient Temperature: External factors such as environmental temperature can affect the thermometer's performance. 2.3