

How to Properly Use the Dial Gauge to Determine Sample z-Position

Philips X'Pert System

MINT Center

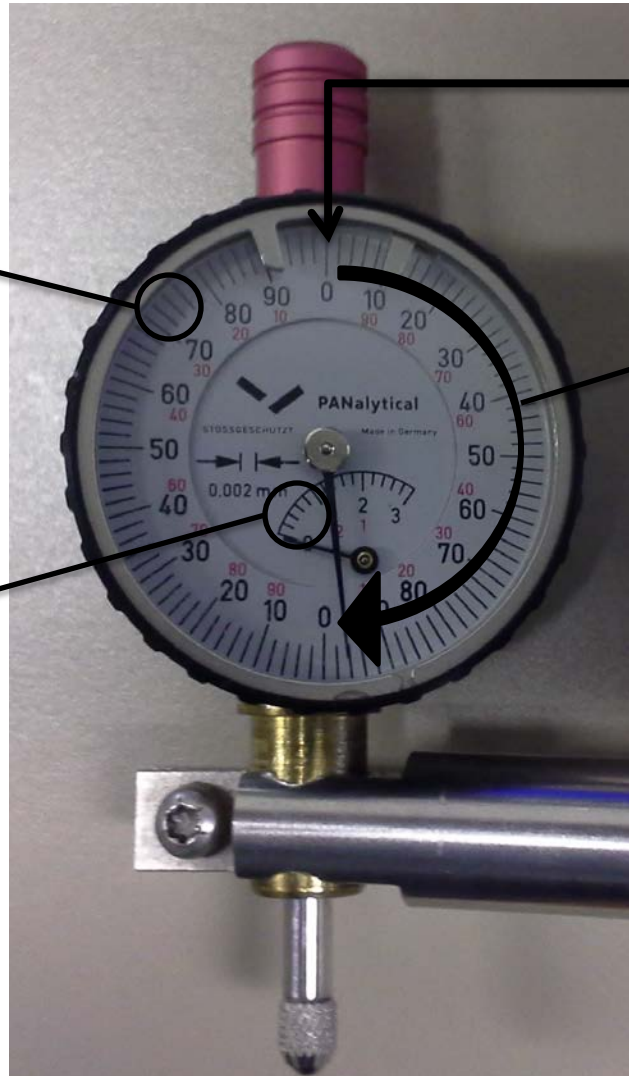
A few facts

- The x-ray line at the sample stage is 20 mm high and 1.2 mm wide.
- Therefore, for samples smaller than 20 mm the intensity method (50% of I_0) DOES NOT WORK.
- In this case you NEED to use the dial gauge!
- You HAVE to know how to use it properly!

The Dial Gauge

There are 50 tick marks per half-turn (100 μm). Distance between tick marks = 2 μm .

Distance between each tick mark = 200 μm (= one full turn of the big hand).



This is the true '0' mark

Half a turn corresponds to 100 μm .

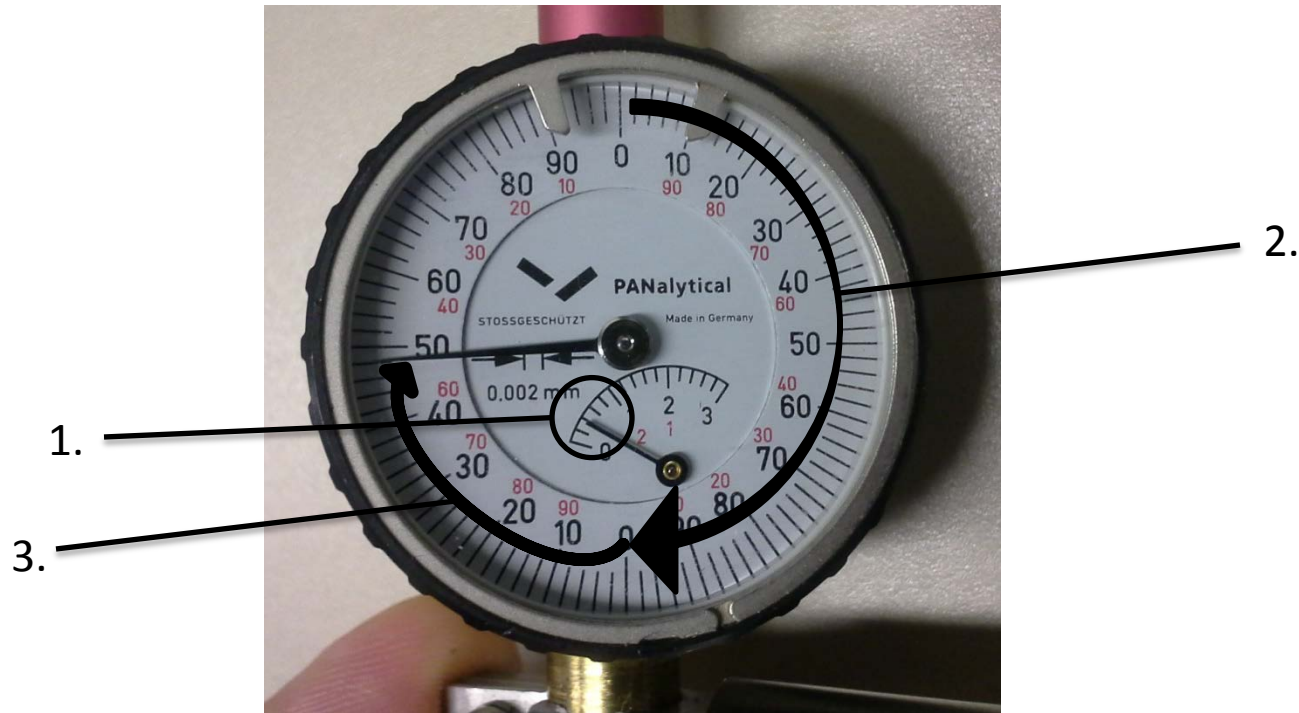
When it shows **1 mm** the sample is at the correct z-position!

How to Read the Gauge (1)



1. Count the tick marks the little hand has passed. In this example 4 tick marks have been passed $\rightarrow 4 \times 0.2 \text{ mm} = 0.8 \text{ mm}$.
2. Read the tick marks the big hand is showing (72) $\rightarrow 0.072 \text{ mm}$
3. Add both numbers: $0.8 \text{ mm} + 0.072 \text{ mm} = 0.872 \text{ mm}$

How to Read the Gauge (2)



1. Count the tick marks the little hand has passed. In this example 1 tick mark has been passed $\rightarrow 1 \times 0.2 \text{ mm} = 0.2 \text{ mm}$.
2. The big hand went past the other '0' mark \rightarrow add 0.1 mm.
3. Read the tick marks the big hand is showing (48) $\rightarrow 0.048 \text{ mm}$
4. Add the 3 numbers: $0.2 \text{ mm} + 0.1 \text{ mm} + 0.048 \text{ mm} = 0.348 \text{ mm}$

Find the Correct z-Position

1. Carefully increase z until dial gauge hands move.
2. Take the dial gauge reading.
3. Calculate: $1 \text{ mm} - \text{dial reading} = \Delta Z$
4. Add ΔZ to the current z shown in the software and type it in as the new position.