

# Dial indicators

(TFT Tools Inc)

**Dial Indicators** are instruments used to accurately measure a small distance. The measurement results are displayed in a magnified way by means of a dial.

They may be used to check the variation in tolerance during the inspection process of a machined part, measure the deflection of a beam or ring under laboratory conditions, as well as many other situations where a small measurement needs to be registered or indicated.

## Applications

- In a quality environment to check for consistency and accuracy in the manufacturing process.
- On the *workshop floor* to initially set up or calibrate a machine, prior to a production run.
- By toolmakers (moldmakers) in the process of manufacturing precision tooling.
- In metal engineering workshops, where a typical application is the centering of a lathe's workpiece in a four jaw chuck. The DTI is used to indicate the *run out* (the misalignment between the work piece's axis of rotational symmetry and the axis of rotation of the spindle) of the work piece, with the ultimate aim of reducing it to a suitably small range using small chuck jaw adjustments.
- In areas other than manufacturing where accurate measurements need to be recorded, eg:- physics.



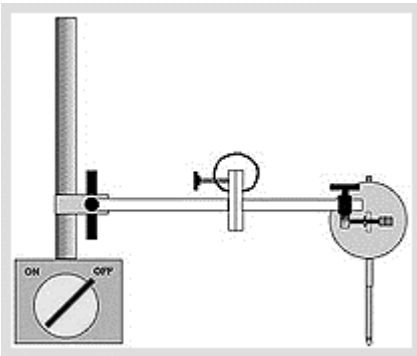
The dial indicator typically consist of a graduated dial and needle to record the minor increments, with a smaller embedded clock face and needle to record the number of needle rotations on the main dial. They may be graduated to record measurements of between 0.001" down to 0.00005" for more accurate usage.

The dial face can be rotated to any position, this is used to orient the face towards the user as well as *set* the zero point, there will also be some means of incorporating limit indicators (the two metallic tabs visible in the right image, at 90 and 10 respectively), these limit tabs may be rotated around the dial face to any required position. The dial

indicators are normally set up in a fixture (possibly a magnetic base) which would secure the dial indicator and allow its adjustment to read zero at the optimal size of a sample part.

## Set Up

**STEP 1:** Attach dial indicator unit to magnetic base as shown in magnetic base diagram below.



**STEP 2:** Place the assembled unit on the out-feed table of your machine with the tip of the dial indicator touching top dead center of your parts making sure there is a slight amount of pressure on the indicator tip. Adjustments in pressure can be made by turning the micro-adjustment knob in the center of the magnetic base arm.

**STEP 3:** Turn the magnetic base to the "ON" position to secure the unit to your out-feed table. At this point using the thumb screw on the right side of the dial indicator set the dial to read "0" (Loosening the screw will allow you to rotate the face of the dial to any point you choose).

**STEP 4:** Slide the magnetic base unit so that while the dial indicator tip is in contact with the part. The measurements obtained should fall within the specifications set in your owner's manual.

The dial indicator can be used for measuring run-out on your table saw, drill press and many other shop items.

**Accessories** – To accomplish the job we do need more than just the dial indicator. Taking full advantage of its capabilities requires a couple “must-have” accessories. The first is a magnetic base.

Regardless of what you want to measure, you can twist and turn the arms of the magnetic base to position the dial indicator right where you need it. And if you need to lock the base in place, all you have to do is flip the switch on the base and the magnet grabs a steel or cast iron surface like it's been nailed in place.

A second accessory we need consider to buy is a set of contact points. The contact point

can easily be changed to ensure you'll have the right tip for the task at hand.

**How to Read:**



Dial face has dual directional graduation of 0.001.

Revolution counter is graduated in 0.1”.

One full revolution of large pointer is one increment of revolution counter.

Example:

The small pointer is between 1. and 2. or between 6 and 7=0.1. or 0.6.

The large pointer is close to line 21 of black digit=0.021.

So the reading is  $0.1+0.021.=0.121$ . Or  $0.6.+0.021.=0.621$ ”.