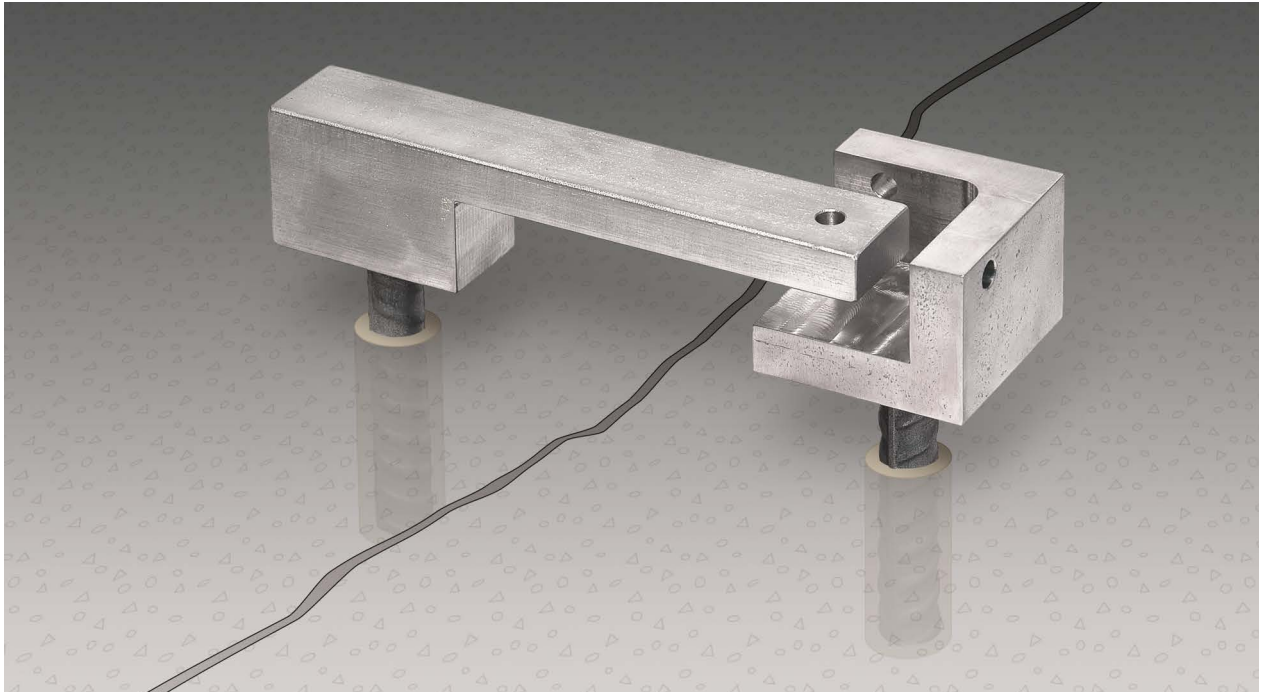

Model 4415

3D Mechanical Crackmeter

Instruction Manual



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1. INTRODUCTION

The GEOKON Model 4415 3D Mechanical Crackmeter is designed to measure movement across joints such as the construction joints in buildings, bridges, pipelines, dams, etc.; tension cracks in soils, and joints in rock and concrete.

The crackmeter is comprised of an extension arm and reference block, which are mounted on opposite sides of the crack or joint being monitored using groutable rebar anchors.

The anchors are made from two lengths of #4 rebar, six inches long, grouted into boreholes drilled on either side of the crack. The crackmeter will measure any widening of the crack and the extent of any shearing movements in two directions.

A typical installation of the 3D Mechanical Crackmeter is shown below.

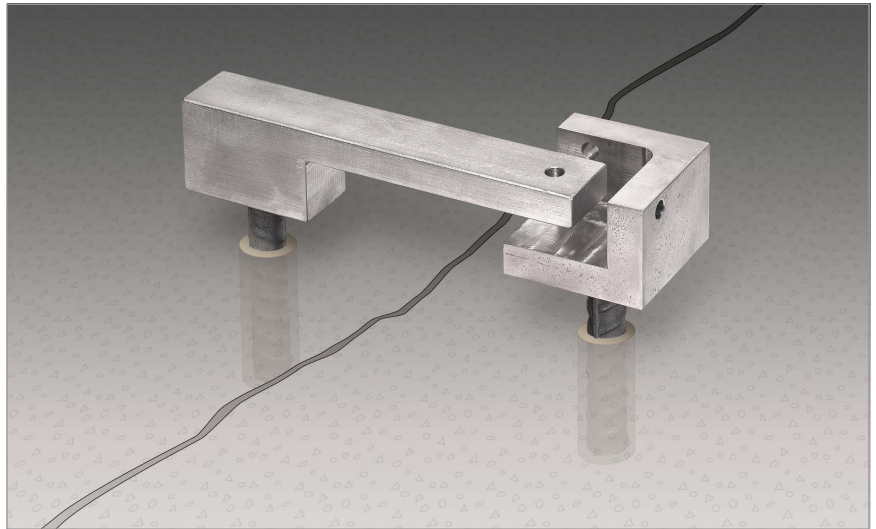


FIGURE 1: *Typical Installation*

Once installed, measurements are made using a depth micrometer or dial gauge that is inserted into each of the three access holes. Displacements (direction and magnitude) are determined by comparing the base readings with the current readings.

2. INSTALLATION

2.1 ALIGNMENT BLOCK ASSEMBLY

An alignment block must be installed between the extension arm and reference block for proper positioning before mounting. The alignment block is easily installed and removed so it can be reused with multiple crackmeters of the same range. The assembly steps differ depending on the model number of the crackmeter.

For Models 4415-1 and 4415-3 refer to the steps below. For model 4415-5 follow the instructions on the following page.

MODEL 4415-1 AND 4415-3 ASSEMBLY:

1. Set the alignment block on the reference block, making sure to align the corresponding holes of both.
2. Secure the extension arm and reference block to the alignment block using the provided screws.

The completed assembly is shown below.

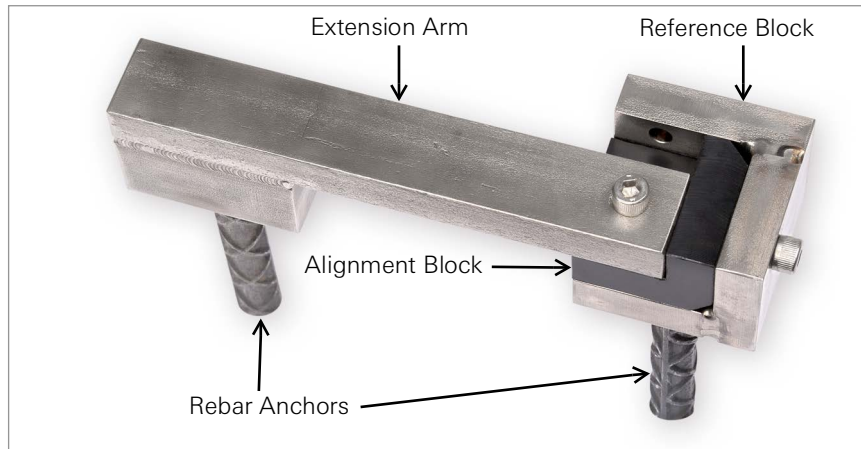


FIGURE 2: Model 4415-1 or 4415-3 Crackmeter with Alignment Block Installed

MODEL 4415-5 ASSEMBLY:

1. Slide the reference block into the gap between the alignment block and factory installed plate until fully seated.
2. Secure the reference block to the alignment block by tightening the pair of screws that do not have washers installed.
3. Attach the extension arm to the reference block using the provided screw and washer.

The completed assembly is shown below.

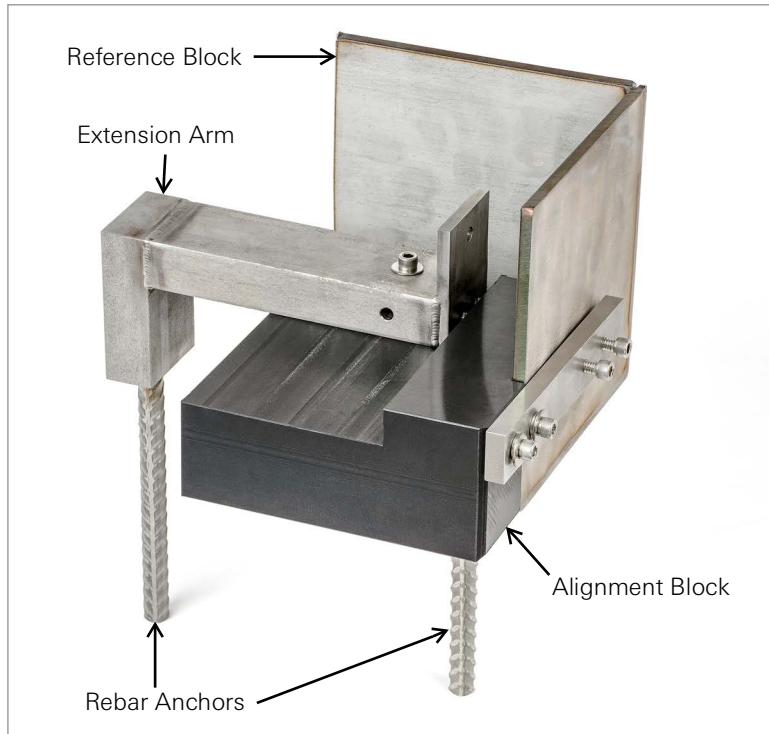


FIGURE 3: Model 4415-5 Crackmeter with Alignment Block Installed

2.2 MOUNTING THE CRACKMETER

1. Position the crackmeter so that the rebar anchors are on opposite sides of the crack being monitored, then mark the location of the anchors.
2. Drill two 5/8 to 3/4 inch holes to the necessary depth in order to leave the crackmeter at the desired height above the surface.
3. Fill both holes with quick-setting grout and insert the anchors into the holes.
4. Align the crackmeter as needed, and keep it in position until the grout sets.
5. Remove the cap screws holding the reference block and the extension arm to the alignment block. Remove the alignment block from the assembly.
6. Initial readings **must be carefully taken and accurately recorded at the time of installation**. These readings serve as a reference point against which all subsequent readings will be compared. To take a reading, follow the instructions in Section 3.
7. Repeat the whole process as needed for multiple installations.

3. TAKING READINGS

The X-axis, as shown in the figures below, measures parallel motion along the axis of the crack. The Y-axis monitors any movement perpendicular to the break. The Z-axis measures vertical movement along the crack.

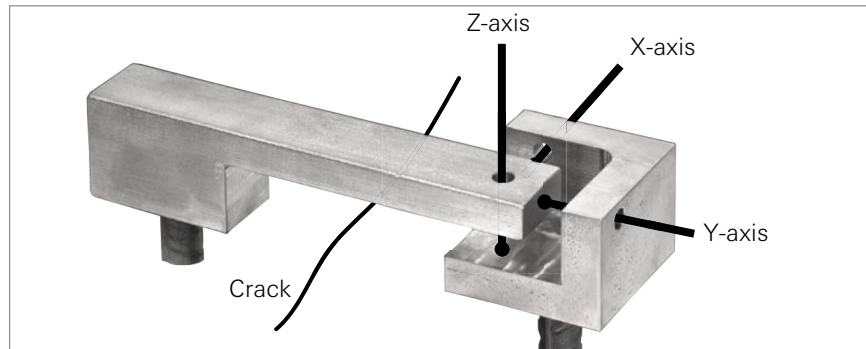


FIGURE 4: Model 4415-1 or 4415-3 Reading Locations

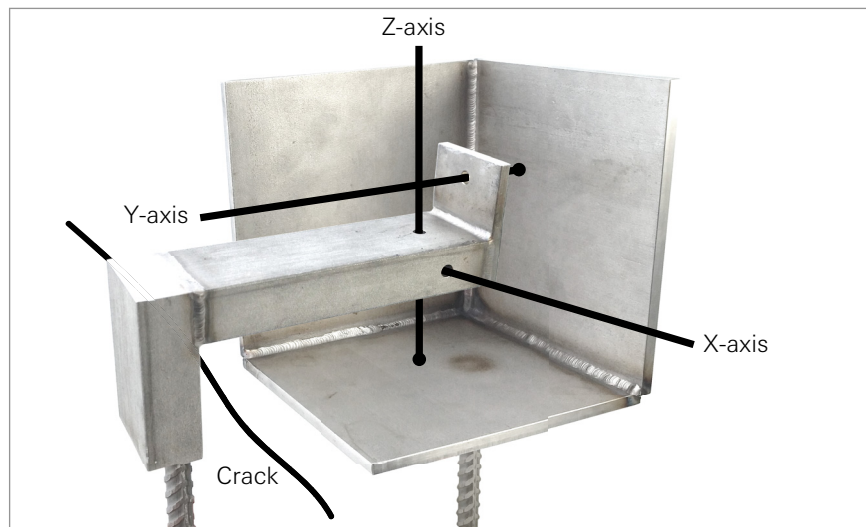


FIGURE 5: Model 4415-5 Reading Locations

Readings can be taken with a dial indicator, depth micrometer, or similar instrument. Record the ambient temperature at the time the readings are taken as large temperature changes may affect the readings.

MODEL 4415-1 OR 4415-3

Z-Axis Reading: Slide the measurement end of the instrument through the Z-axis hole in the extension arm (see Figure 4) until it contacts the reference block. Press the collar/base of the instrument firmly against the surface of the extension arm and take a reading.

X and Y Axes Reading: Slide the measurement end of the instrument through the X- or Y-axis hole in the reference block (see Figure 4) until it contacts the extension arm. Press the collar/base of the instrument firmly against the surface of the reference block and take a reading.

MODEL 4415-5

X and Y and Z Axes Reading: Slide the measurement end of the instrument through the X, Y, or Z hole in the extension arm (see Figure 5) until it contacts the reference block. Press the collar/base of the instrument firmly against the surface of the extension arm and take a reading.

APPENDIX A. SPECIFICATIONS

A.1 CRACKMETER SPECIFICATIONS

Mechanical Range in each X, Y, Z axis	4415-1: 0-12.5 mm 4415-3: 0-25 mm 4415-5: 0-50 mm
Material	Stainless Steel
Anchors	#4 Rebar
Anchor Dimensions (Dia. x Length)	12 mm x 150 mm

TABLE 1: Crackmeter Specifications

A.2 TYPICAL DEPTH MICROMETER / DIAL GAUGE SPECIFICATIONS

Range	50-150 mm
Resolution	0.01 mm
Accuracy	0.05 mm

TABLE 2: Typical Depth Micrometer / Dial Gauge Specifications

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