

## EC (EASY CONNECT) INCLINOMETER CASING INSTALLATION GUIDE

Thank you for purchasing Soil Instruments EC (Easy Connect) Inclinometer Casing. During the installation of your Inclinometer the advantages of our EC connecting system will become apparent. This system greatly reduces installation time and virtually eliminates assembly errors.

### Assembling EC Casing

Each length of casing has a male end with an alignment key, an O-ring and a lock ring; the female end has an alignment keyway. To assemble EC, simply align the male and female keys and push together

### Installing Bottom Cap

**IMPORTANT:** Always install the female end with bottom cap first

- Remove protective caps (the male end is pre-greased) Take care not to get dirt onto the grease as this may compromise the seal.
- Place bottom cap on level ground with male end up, push female end of casing onto the cap, you will hear a "click" as the lock ring is seated.



**IMPORTANT:** The arrows on the EC Casing are for manufacturing purposes and do not relate to the orientation of the casing

### Installing Casing in Borehole

- Remove protective caps one at a time immediately prior to using each casing length.
- Support or clamp the lower casing. Ensure the O-ring is within the 'O'-ring groove all the way around the joint as shown in the pictures opposite.
- Align the key and keyway of the two sections.
- Push the upper casing onto the supported lower casing until the joint snaps closed.



**WARNING:** DO NOT rock the upper casing backwards and forwards as this will distort the female section and damage the casing

- Lower casing into borehole.
- Repeat until installation depth achieved.

**INFORMATION:** to counteract buoyancy of the casing, fill the assembled casing with clean water

### On Completion

- Cut off any excess casing with a hacksaw
- Install top cap or lockable top cap assembly.

See overleaf for handling, storage and further installation advice.

## **Handling & Storage**

EC Inclinometer Casing is supplied in boxes of 10 x 3m lengths. Each box weighs approximately 38 kilograms. To comply with manual handling regulations we recommend that boxes should always be carried by two people.

Casing must be supported evenly, to ensure it does not warp or bend during storage. Avoid storage in direct sunlight as this can cause deformation of the casing.

## **Installation Advice**

### **DEPTH**

Always check the borehole/installation depth, before commencing installation.

### **ALIGNMENT**

**WARNING:** **It is crucial to ensure one set of grooves is in-line with the expected direction of movement.**

Misaligned casing is the main reason for engineers rejecting Inclinometer installations. The alignment of the grooves should be maintained during the installation of the casing, failure to do this could result in spiralling. Do not rotate the casing after installation, as this will induce spiral. Should the casing be installed with incorrectly aligned grooves, this can be corrected on some Inclinometer Processing Software packages by inputting skew angles determined from a spiral probe. Should spiralling be suspected Soil Instruments Limited are able to carry out a spiral survey of the installation.

### **GROUTING**

The strength of the grout backfill is fundamental to an Inclinometer providing good data. Ideally, the strength of the grout should match the strength and deformation characteristics of the surrounding strata. Control of grout strengths, particularly for a weak grout is not always easy under field conditions. Grout properties depend on material proportions, mixing equipment, mixing sequence, temperature etc. The grout must be sufficiently fluid to allow it to be easily pumped down the hole.

Depending on the diameter of the borehole/casing/void former the installation can either be pre-grouted and the Inclinometer casing installed into the grout; or if the diameter permits the Inclinometer casing installed first followed by the grouting process. For both techniques if water or drilling fluids are present in the borehole a tremie pipe/hose must be lowered to the base of the installation and the water/drilling fluids displaced with grout. Further advice on grouting is available from Soil Instruments Limited.

### **BUOYANCY**

Inclinometer casing will float in a water-filled borehole, to counteract buoyancy the Inclinometer casing must be filled with clean water during the installation process. This buoyancy is increased when grout is introduced to the installation. To counteract this greater buoyancy a down force should be applied to the bottom of the casing. Only on shallow installations when the annulus between the OD of the Inclinometer casing and the diameter of the installation is small can a downward force be applied from the top of the casing, otherwise distortion of the Inclinometer will occur.

### **COMPLETION WORKS**

After successfully installing your Inclinometer casing and recovering temporary drill casing, the following day the installation should be checked, if required the grout topped up and protective headwork's/cover installed to ensure your instrument remains in good order. After 3-4 days, base readings can be taken, we recommend 3 sets of readings are taken to ensure repeatability of data.

During any stage of the installation Soil Instruments will be pleased to offer advice.

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