

QD (QUICK DRIVE) INCLINOMETER CASING INSTALLATION GUIDE

Thank you for purchasing Soil Instruments QD (Quick Drive) Inclinometer Casing. During the installation of your inclinometer the advantages of our Easy Connect connecting system will become apparent. Quick Drive casing is designed to improve the viability of installing standard diameter inclinometer access tube in pre-formed window sampling holes.

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.

Installation Guide

1. Drill hole to the required depth and ream out to the optimum diameter.



2. Once the barrels have been jacked out, lower the cone into the hole. It is crucial, at this stage to ensure that one set of internal 'grooves' is in line with the expected direction of movement.



3. Pour a grout mix into the hole to act as a lubricant, reducing skin friction between the inclinometer tube and the sidewalls of the borehole.



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5. It is advisable to closely monitor the orientation of the casing to ensure the hammer action does not induce rotation leading to misaligned 'grooves'.

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

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



6. The casing should now be hammered down close to ground level. At this stage it may be necessary to extract the drill rods if you are not confident of assembling the rods inside of the inclinometer. Remove protective tape from 'male' end and offer the female end of the next length, ensuring that the keyways are aligned.

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

7. Leaving the protective cap in place, GENTLY tap down on the new length of casing until a "click" sound is heard from the joint. The cap can now be removed and an additional drill rod lowered into the tube, threaded onto the previous rod and hammering resumed.

Repeat process until casing is driven down to Required depth. Upon completion backfill any annulus with a suitable grout mix.

On Completion

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



IMPORTANT NOTES: It is advisable to check that all drill rods to be used will fit through the inclinometer casing prior to installation. The ID of the casing is 58mm.

A smear of grease of the end of the first drill rod will help prevent a pressure weld occurring between the rod and the mild steel drive in cone.

Care must be taken to keep the inside of the inclinometer casing free from dirt. All installations should be tested with a dummy probe prior to taking base readings.

See overleaf for handling, storage and further installation advice.

Comprehensive information about this product and our full range is available at www.itmsoil.com
If you would like to speak with someone directly please call +44 (0)1825 765044 or email sales@itmsoil.com

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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