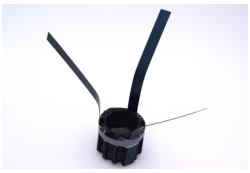

Magnetic Extensometer

STRUMENTI E MISURE GEOTECNICHE
E STRUTTURALI

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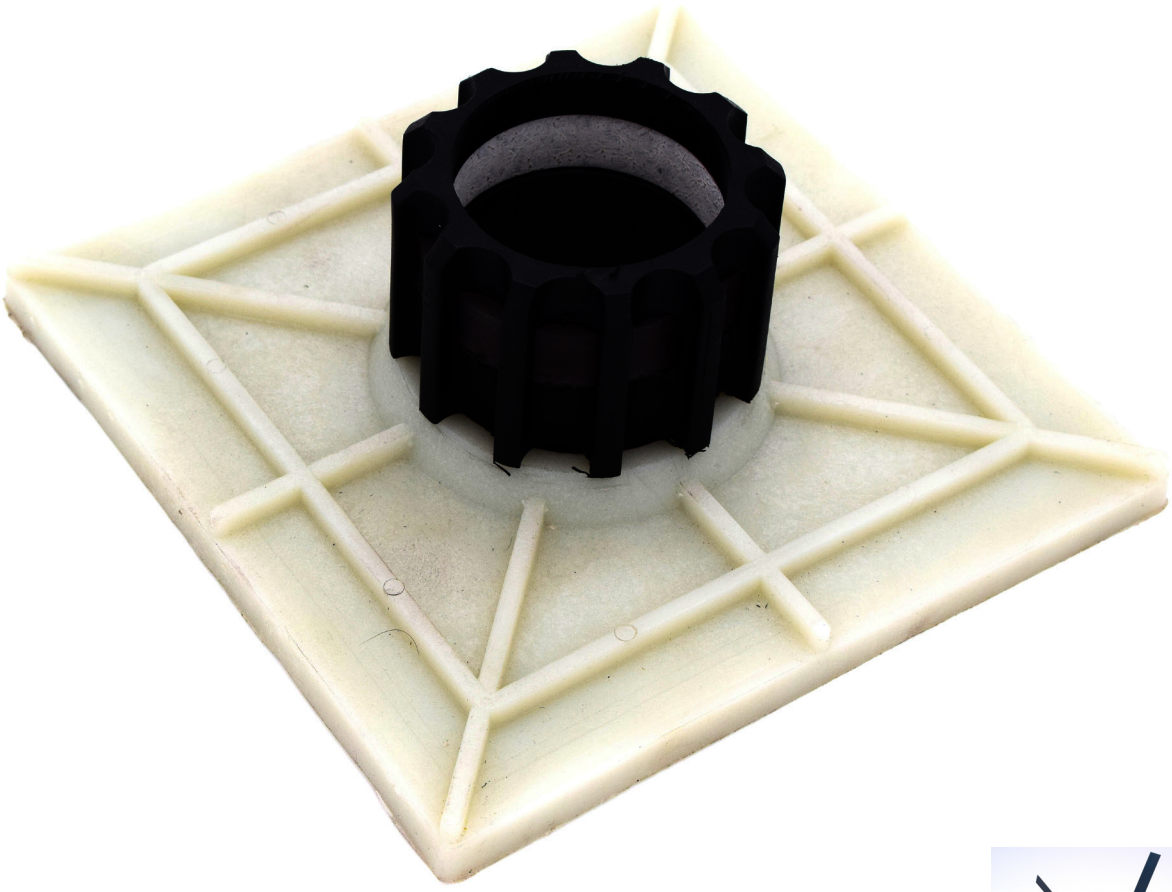
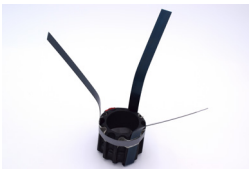
Magnetic Extensometer





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WARNINGS

This instrument must be utilized only for the application it has been designed for, OTR declines all responsability for any improper use.

Do not let the instrument fall into the hole quickly.

Do not put the instrument in flammable liquids or potentially explosive gases.

Do not use the instrument in water where an electric dissipation is in progress.

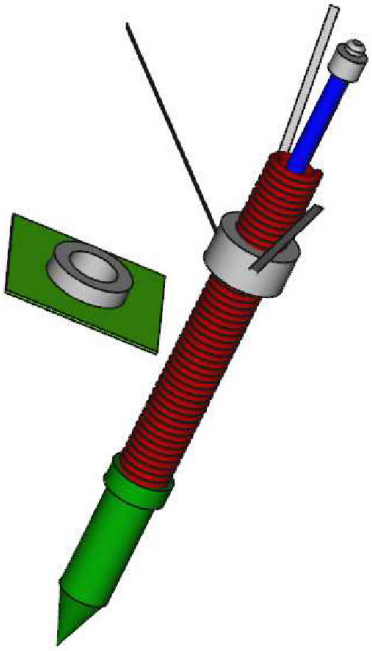
Use protective gloves.

Furthermore

- Do not open the instrument, contact the manufacturer for checks and repairs;
- Keep out of reach of children;
- Do not connect the instrument to the readout unit with wet hands;
- Clean the instrument and its cable with alcohol or water, do not use acetone or aggressive liquids for plastics or labels;
- Use surge arresters for installations with unprotected cables longer than 30 meters.

Applications

Extensoinclinometric column measures possibile distance variations between magnetic rings set around the inclinometric pipe. These distance variations reflect ground settlement at different depths.



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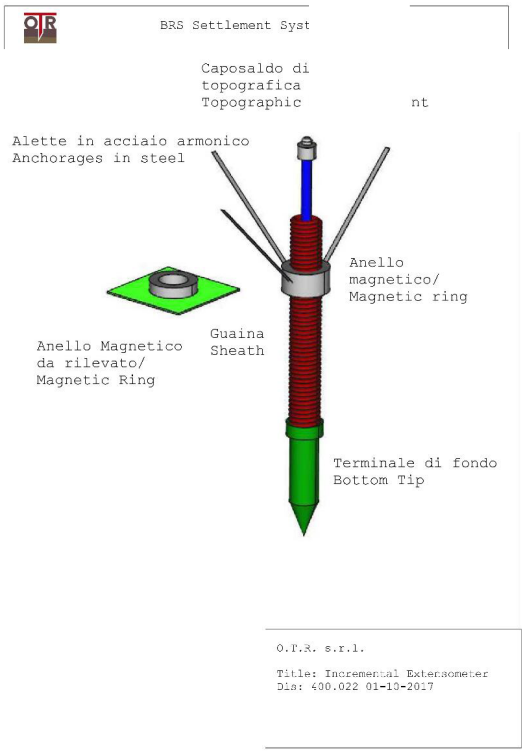
Description



Installation includes:

- PVC pipe with external diameter of 34 mm and internal diameter of 28 mm, made of 2mt. jointable pieces, threaded at both ends. In the pipe, suspended in an antifriction sheath, extensometric probe is lowered to take measures;
- Corrugated PE antifriction sheath. Sheath is delivered as a roll. Shorter pieces of 1mt. or more can be cut off and easily jointed together;
- Plastic pipe segment (bottom end), with max external diameter of 70 mm and 300 mm long. It allows a vertical shift of PVC pipe.
- Magnetic rings with steel anchors to be fixed in ground or with square plates to be fixed in embankments
- Suspension anchor (top end) to suspend pipe and allow its shift in the bottom end.
- Top closing cap.

Identification

Each device is labelled with:

- Batch ID;
- Model;

Technical Specification

Sheath material	PVC jointed every 1 meter
Pipe material	PVC pipes 2 mt. long

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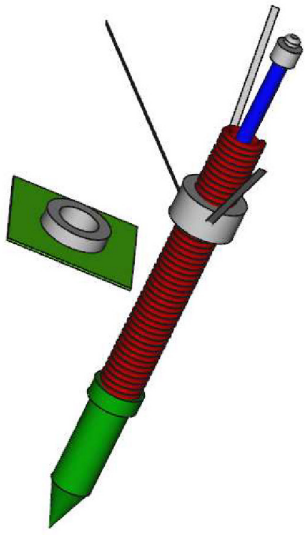
Installation

Extensometer can be installed in a perforation borehole or in an embankment.
Minimum diameter for borehole is 100 mm.
Before installation, insert all of the pipe segments, with the exception of the bottom pipe, in sheath segments of the same length.

- Install the first pipe segment into the bottom segment.
- PVC cap with 1' diameter, used to close bottom end of pipe, can be found in the bottom cap.
- Screw bottom segment of sheath (which is 30cm shorter than bottom pipe segment) onto bottom pipe, and seal it with scotch tape.



In hole installation

- verify hole depth;
- insert in borehole first segment of pipe, already installed onto bottom segment and sheath;
- Screw onto the first pipe segment a new one, already inserted in its sheath;
- screw the two sheath segments together, and seal with scotch tape;
- screw together all of the pipe segments until column reaches borehole bottom;
- Install first magnetic ring at the desired depth, and fix it to pipe with scotch tape in order to prevent it from shifting during installation works.
- Repeat 5 and 6 until installation completes.
- During installation, verify rings' depths with magnetic probe, and verify pipe can freely shift inside bottom segment.
- Cement borehole, using a mixture with similar mechanical characteristics to those of surrounding round. Fill borehole to the top.
- After installation, measure magnetic rings' positions with magnetic probe and store values.

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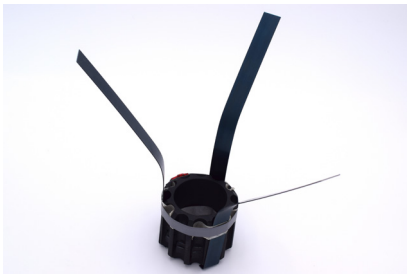
Embankment Installation

- In case installation is made in an embankment:
- Install extensometric column in foundations round as explained above. Installation should be made a few days before embankment construction begins;
- Build a cement block on the surface to temporarly fix pipe;
- Measure initial position of magnetic rings, and of top cap as well;
- Remove temporary top block.
- Proceed with column construction as embankment grows, using magnetic square plates;
- Compact embankment paying attention not to damage extensometer system
- Surround extensometer colunm with embankment material with manual tools
- During embankment grow, fix pipe segments and sheath segments together, following a vertical dirction;
- Mount new segments until end of embankment.
- Periodically verify that pipe freely shifts inside bottom segment.



Final Mounting

1. cut away all the sheath that might be hanging out of round surface;
2. insert suspension ring on top of pipe;
3. lift pipe 30cm higher. This way pipe is free to lower into bottom segment
4. firmly fix suspension ring;
5. cut away pipe in excess.
6. close with top cap

Build a protecting cemented well (50x50) for ground anchoring; Measures are taken with a magnetic probe, and reflect relative distance between rings. Top cap position is to be measured as well.

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Taking Measurements

- To take measurments is used a settling probe with centimetrated cable, with a switch sensitive to the magnetic field of the magnetic rings on the tip. The switch starts an acustic signal.