

E17 ROD EXTENSOMETER SYSTEMS

Datasheet E17



Description

The Rod Extensometer system accurately measures settlement and/or heave at single or multiple anchor points in a borehole relative to its reference head.

The system employs up to eight rods, anchored along the axis of a borehole with a diameter from 50mm up to 200mm, terminating in the reference head at the borehole entrance.

The Rod Extensometer system can be assembled on site or can be supplied pre-assembled to specified lengths and coiled to

ensure a quicker and easier installation.

A versatile range of options are available for Rod Extensometers:

- Automatic or manual reading
- Hydraulic anchoring for soil
- Groutable anchoring for rock
- Multiple or single point rod reference heads

Features

- Rods and heads are available pre-assembled to customer specified lengths
- Fibreglass rods (GRP)
- Various anchor types available
- Remote monitoring using Vibrating Wire displacement transducers and wireless systems such as GTec Link
- Up to 8 measuring points per borehole
- Lighter, condensed construction

Benefits

- Quicker deployment than conventional rod extensometer systems
- Less sensitive to temperature changes than steel
- Enabling installation in varied soil conditions and orientation
- Ideal for remote and difficult to access locations
- Provides greater visibility of the settlement profile
- Lower shipping costs and easier to manoeuvre on site



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

Operation

Relative movement between the end anchor and the reference tube is measured with either a digital depth gauge, or a displacement transducer inserted through the reference tube and registering on to the free end of the rod.

The ground condition determines the type of anchor to use:

- Groutable anchors for downhole installation in rocks
- Hydraulic anchors (single or double ended) for soft soils
- Packer anchors for jointed rocks, where there is flowing water, or uphole installations

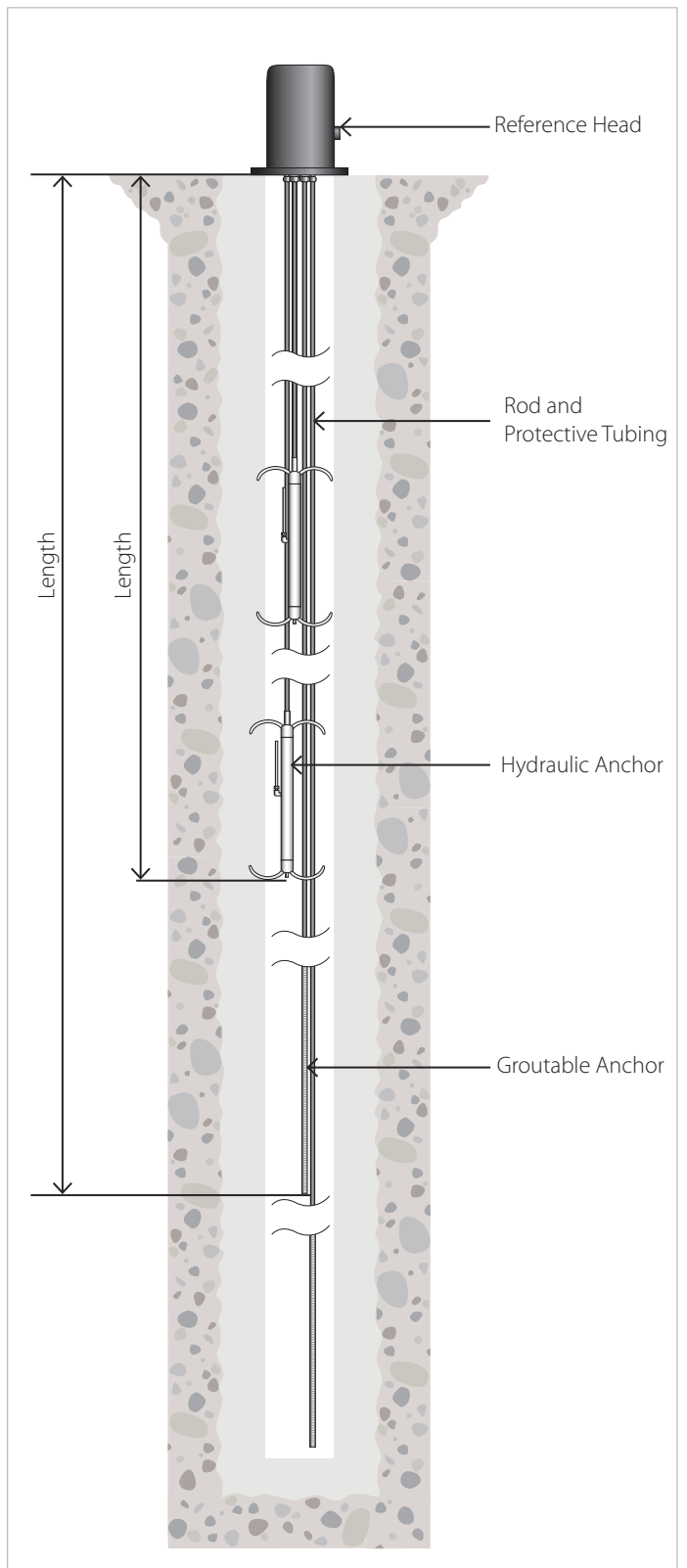
The extensometers have reference heads with provision for up to eight measuring points per borehole. Borehole diameters may be in the range of 100mm-200mm.

Applications

Continuous Rod Extensometers are used to monitor small scale rock and soil movements to a high degree of accuracy, including settlement and heave of foundations and relaxation or subsidence of rock around tunnels, shafts, caverns and abutments.

Typical applications include:

- Monitoring settlement and heave in foundations
- Monitoring tunnels, shafts, caverns and abutments
- Control of natural and cut slopes, quarry and mining excavations
- Monitoring deformation of retaining walls, bridge piers and abutments



Associated products

For details on:

Catalogue code:

Dataloggers

D1

VWnote

RO-1-VW-NOTE

View our full product range on soilinstruments.com

THE TECHNICAL RATING FOR THIS PRODUCT:

As the correct installation of any monitoring sensor or system is vital to maximise performance and accuracy, Soil Instruments makes the following recommendations, for the skill level of the installation contractor.

ADDITIONAL SUPPORT

We offer installation and monitoring services to support this system. For more information please email : sales@soilinstruments.com or call : **+44 (0) 1825 765044**

ADVANCED



ADVANCED



The installer is trained and experienced in the installation of this type of instrument or systems, and is ideally a specialist Instrumentation and Monitoring contractor.

INTERMEDIATE



The installer already has previous experience and/or training in the installation of this instrument or system.

BASIC



As a minimum the installer has read and fully comprehends the manual, and if possible has observed these instruments or systems being installed by others.

Specifications

Sensors and Gauges

Type	Vibrating Wire Transducer	Digital Depth Gauge
Ranges	30mm 50mm 100mm	±60mm
Accuracy	0.2% full scale	±0.02mm
Resolution ¹	±0.025% full scale	0.01mm
Temperature range	-20 to +80°C	n/a
Thermistor fitted	NTC 3k Ω	n/a
Thermistor accuracy	±0.5°C	n/a
Thermistor resolution ¹	0.1°C	n/a
Excitation method	Pluck or sweep	n/a
Material	316 grade Stainless Steel	n/a
Ingress protection	IP68 to 1700kPa	n/a

Anchors

Type	Groutable	Packer	Hydraulic – single ended or double ended
Material	Steel	Steel	Steel
Diameter	16mm	94/120mm	32mm
Length	400mm	600mm	450mm (single) / 820mm (double)

Rod

Type	Fibreglass Continuous	Fibreglass assemble on site lengths	Stainless steel assemble on site lengths
Diameter	5mm	5mm	5mm
Minimum length	1m	1m	1m
Maximum length	100m	3m	3m

Sleeves

Type	Fibreglass Continuous	Fibreglass assemble on site lengths	Stainless steel assemble on site lengths
Material	Nylon 12	Nylon 12	Nylon 12
Outer diameter	10mm	10mm	10mm

Ordering Information

Groutable Anchors

16mm dia x 400mm long, Datum is end of anchor

E17-G-400	Groutable anchor 16mm diameter 400mm long
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Hydraulic Anchors – single ended

For boreholes upto 200mm diameter, Datum is end of anchor

E17-S-HYD	Single ended hydraulic anchor for boreholes up to 200mm
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Hydraulic Anchors – double ended

For boreholes upto 200mm diameter, Datum is mid point of anchor

E17-D-HYD	Double ended hydraulic anchor for boreholes up to 200mm
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Groutable Packer Anchor

Datum is mid point of anchor

E17-PACK-94	Groutable packer anchor for boreholes 94mm to 120mm
E17-PACK-120	Groutable packer anchor for boreholes 120mm to 150mm

Reference Heads - manual reading - for use with Digital Depth Gauge

E17-MAN-1	Single point rod reference head
E17-MAN-2	2 point rod reference head
E17-MAN-3	3 point rod reference head
E17-MAN-4	4 point rod reference head
E17-MAN-5	5 point rod reference head
E17-MAN-6	6 point rod reference head
E17-MAN-7	7 point rod reference head
E17-MAN-8	8 point rod reference head

Ordering Information

Reference Heads - remote reading - for use with 30mm/50mm VW displacement transducers

E17-30-50-1	Single point rod reference head
E17-30-50-2	2 point rod reference head
E17-30-50-3	3 point rod reference head
E17-30-50-4	4 point rod reference head
E17-30-50-5	5 point rod reference head
E17-30-50-6	6 point rod reference head
E17-30-50-7	7 point rod reference head
E17-30-50-8	8 point rod reference head

Reference Heads - remote reading - for use with 100mm VW displacement transducers

E17-100-1	Single point rod reference head
E17-100-2	2 point rod reference head
E17-100-3	3 point rod reference head
E17-100-4	4 point rod reference head
E17-100-5	5 point rod reference head
E17-100-6	6 point rod reference head
E17-100-7	7 point rod reference head
E17-100-8	8 point rod reference head

Measuring Equipment

E17-M-120	Digital Depth Gauge with mounting bush adaptor for manual reading ± 60 mm
E10-6-30-T	VW displacement transducer for multipoint head, range 30mm with thermistor and termination wires
E10-6-50-T	VW displacement transducer for multipoint head, range 50mm with thermistor and termination wires
E10-6-100-T	VW displacement transducer for multipoint head, range 100mm with thermistor and termination wires
E10-6-30S-T	VW displacement transducer for singlepoint head, range 30mm with thermistor, specify cable length
E10-6-50S-T	VW displacement transducer for singlepoint head, range 50mm with thermistor, specify cable length
E10-6-100S-T	VW displacement transducer for singlepoint head, range 100mm with thermistor, specify cable length

Rod and Sleeves

E17-GRP-5	Fibreglass rod, price per metre, $\varnothing 5$ mm fibreglass rod assembled to head on continuous system
E17-PS-10	Protective sleeve, price per metre, $\varnothing 10$ mm OD assembled to head on continuous system
E17-PS-10-3M	Protective sleeve, 3m long includes coupler
E17-SS-3M	Stainless steel 5mm diameter rod, 3m long
E17-SS-2M	Stainless steel 5mm diameter rod, 2m long
E17-SS-1M	Stainless steel 5mm diameter rod, 1m long
E17-GRP-3M	Fibreglass rod 5mm diameter, 3m long
E17-GRP-2M	Fibreglass rod 5mm diameter, 2m long
E17-GRP-1M	Fibreglass rod 5mm diameter, 1m long
E17-L-A	Length adjustment rod, for separate rod system

Installation Equipment

E17-GV-16	Grout and air vent pipe 16mm diameter
E17-KIT-TOOL	Installation tool kit
E17-G-TOOL	Transducer gland tightening tool
E17-RN-TOOL	Reference nut fitting tool for manual reading systems
CA-3.1-4-IC	4 core cable (1 x VW sensors 1 x thermistor) for single rod heads
CA-2.2-6-SC	6 core cable (2 x VW sensors 1 x thermistor)
CA-2.2-8-SC	8 core cable (3 x VW sensors 1 x thermistor)
CA-2.2-10-SC	10 core cable (4 x VW sensors 1 x thermistor)
CA-2.2-12-SC	12 core cable (5 x VW sensors 1 x thermistor)
CA-2.2-18-SC	18 core cable (6 to 8 x VW sensors 1 x thermistor)
E17-FIX-G	Groutable anchor fixing kit for head assembly
E17-FIX-EX	Expanding anchor fixing kit for head assembly

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