E17 ROD EXTENSOMETER SYSTEMS





Description

The Rod Extensioneter system accurately measures settlement and/or heave at single or multiple anchor points in a borehole relative to it's 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

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

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

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



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PRECISELY MEASURED

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

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Sensors and Gauges				
Туре	Vibrating Wire Transdu	JCET	Digital Depth Gauge	
Ranges	30mm 50mm 100mm 150n	nm 200mm	±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	Pluck or sweep		
Material	316 grade Stainless St	teel	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				
Туре	Fibreglass Continuous	Fibreglass assemble on site lengths	Stainless steel assemble on site lengths	
Diameter	5mm	5mm	5mm	
Minimum lenath	1m	1m	1m	
	100m	3m	3m	
Maximum length				
Maximum length Sleeves				
Maximum length Sleeves Type	Fibrealass Continuous	Fibrealass assemble on site lenaths	Stainless steel assemble on site lengths	
Maximum length Sleeves Type Material	Fibreglass Continuous Nylon 12	Fibreglass assemble on site lengths Nylon 12	Stainless steel assemble on site lengths Nylon 12	

Groutable Anchors	
16mm dia x 400mm long, Datum is en	d of anchor
E17-G-400	Groutable anchor 16mm diameter 400mm long
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
Hydraulic Anchors - double ende	d
For boreholes upto 200mm diameter,	Datum is mid point of anchor
E17-D-HYD	Double ended hydraulic anchor for boreholes up to 200mm
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 readin	g - 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

Soil Instruments Limited has an ongoing policy of design review and reserves the right to amend these specifications without notice. E17 - Rod Extensometer Systems - **V1002**

Ordering Information

Reference Heads - remote reading

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Head type	30/50mm	100mm	150mm	200mm	
Single point reference head	E17-30-50-1	E17-100-1	E17-150-1	E17-200-1	
2 point reference head	E17-30-50-2	E17-100-2	E17-150-2	E17-200-2	
3 point reference head	E17-30-50-3	E17-100-3	E17-150-3	E17-200-3	
4 point reference head	E17-30-50-4	E17-100-4	E17-150-4	E17-200-4	
5 point reference head	E17-30-50-5	E17-100-5	E17-150-5	E17-200-5	
6 point reference head	E17-30-50-6	E17-100-6	E17-150-6	E17-200-6	
7 point reference head	E17-30-50-7	E17-100-7	E17-150-7	E17-200-7	
8 point reference head	E17-30-50-8	E17-100-8	E17-150-8	E17-200-8	

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
E10-6-150-T	VW displacement transducer for multipoint head, range 150mm with thermistor and termination wires
E10-6-200-T	VW displacement transducer for multipoint head, range 200mm 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
E10-6-150S-T	VW displacement transducer for singlepoint head, range 150mm with thermistor, specify cable length
E10-6-200S-T	VW displacement transducer for singlepoint head, range 200mm with thermistor, specify cable length

Rod and Sleeves

E17-GRP-5	Fibreglass rod, price per metre, Ø5mm fibreglass rod assembled to head on continuous system
E17-PS-10	Protective sleeve, price per metre, Ø10mm 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 (One per anchor)

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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