



岩土工程与结构健康
监测仪器供应商



产品专辑





岩土工程与结构健康监测仪器供应商
公司简介



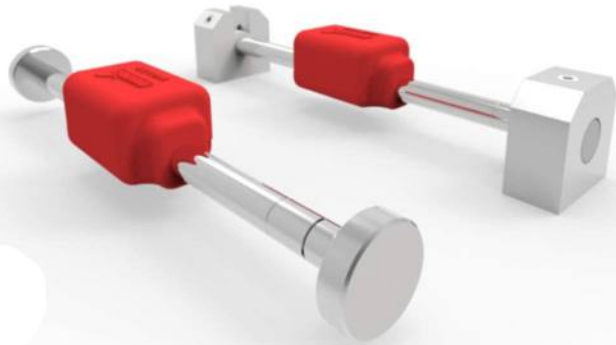
— 经验 & 创新

SISGEO 公司成立于 1993 年，继承了意大利岩土工程领域的行业领导者——“SIS Geotechnica”公司的技术能力。多年以来，我们这个紧密团结而又充满活力的工作团队，一直用热忱和创造力来致力于设计和制造出更高质量的仪器设备，以满足土木工程领域不断增长的广泛需求。得益于此，SISGEO 已经在国际上脱颖而出，赢得了广泛的认可。

SISGEO 一直坚持在持续关注行业的未来需求和不断创新的基础上发展我们的产品和服务，这个经验是我们不断发展的坚实基础。

经过多年的发展，SISGEO 已经成为一个在产品质量、可靠性和创新能力方面都获得了极高行业认可的国际性品牌。

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— 意大利制造

SISGEO 公司总部设立在意大利马萨太工业区，位于米兰东部。有一栋建筑面积超过 2000 平方米的三层成办公楼，设有办公室、实验室、制造部门和仓库，还有一栋独立的建筑物用来生产玻璃纤维材料的多点位移计，此外，还有超过 500 平方米的外部空间可以独家使用。

Made in Italy (意大利制造) 是我们企业经营的核心理念之一，同时也是一种历史、创意、风格和热忱的传承——我们很自豪给世界带来了我们的产品和服务，并赢得了国际土木工程界在技术上的广泛认可。



1 VK40 振弦式应变计



— 我们传递未来

我们关注仪器在工程现场的应用表现，并以此为准侧来设计我们的生产制造工艺流程，以期减少任可环境因素给仪器带来的不良影响。

“提供解决方案”，系统地介绍我们自己的产品与服务，因为对于客户来说，做什么、怎么做是最重要的。掌握更先进的技术，合理利用那些与我们合作过的工程技术人员的意见反馈，能够使我们更加贴合用户的需求。这是我们一直遵循的发展道路的基础，也是规划、设计和构建是我们自身提高和简化客户工作的必由之路，我们相信，与客户之间的良性互动是至关重要的，可以使我们获取更加宝贵的经验并激发我们的创造力。

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OMNIAlog 数据记录



— 我们的团队

3



— 一系列海外公司的成立，使我们能够扩大SISGEO在海外市场的影响力，可以为单独的市场区域提供更有针对性的解决方案。

— SISGEO 是一个集团公司，它的旗下包括：FIELD S.r.l.,SISGEO International S.A.,SISGEO Asia Pacific Co.,Ltd.,SISGEO Zemin A.S.,MONITORIZA S.a.S. 等一系列分公司。

Field S.r.l. 公司成立于 2000 年，专业提供岩土工程与结构监测系统的集成与定制解决方案，涉及系统设计、仪器安装和数据管理等环节。其服务内容包括：现场测试与授权的实时数据管理服务（依托创新的WMS网络监测系统软件）

— 一系列海外公司的成立，如SISGEO International（瑞士）SISGEO ASIA PACIFIC（泰国），SISGEO ZEMIN（土耳其）和MONITORIZA（哥伦比亚）等，使我们能够扩大SISGEO在海外市场的的影响力，可以为单独的市场区域提供更有针对性的解决方案。

3 PK45I 振弦式渗压力（贯入式）



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SISGEO 实现产品质量保证的基本理念包括：制造工艺的流程控制，客户意见的良性反馈与团队组织的良好管理。

— 100% 质量保证

COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV GL
= ISO 9001 =

SISGEO 实现产品质量保证的基本理念包括：制造工艺的流程控制、客户意见的良性反馈与团队组织的良好管理。SISGEO 公司在1997 年获得 ISO9001 质量管理体系认证证书，从那时开始，一直保持并延续着质量管理体系在公司各个层面的生产与管理中的广泛应用，这里我们不但改进、演变和发展的源泉。

4

S5MA 可调板模拟倾斜计

— 技术激情

SISGEO采用了创新的自动化控制生产解决方案，优化了产品制造工艺流程的工作效率。这种工作效率和我们一直以来的热忱服务意识在一起，确保我们能够以最高的标准为客户提供产品与服务。



5

研究和开发能力是 SISGEO 最显著的特征。

这表现在无论是在新的活着创新性的产品设计方面，还是在产品制造工艺流程的设备优化方面，我们都承诺我们的产品线总是采用最现代化的工艺技术。

随着销售的稳定曾长，SISGEO 采用了创新的自动化控制生产解决方案，优化了产品制造工艺流程的工作效率。这种工作效率和我们一直以来的热忱服务意识在一起，确保我们能够以最高的标准微克提供产品与服务。

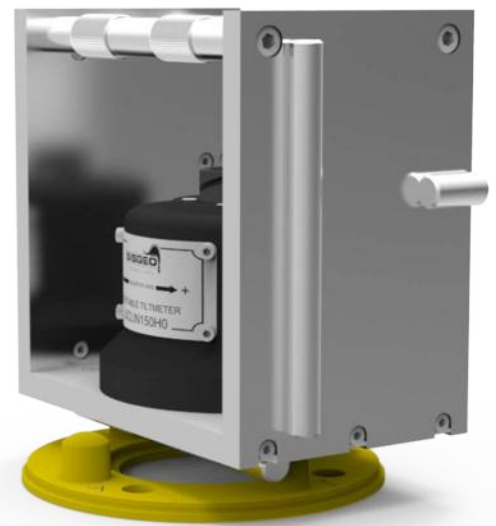
SISGEO范围广泛的产品采用了多种不同原理的传感技术，包括振弦式传感技术和其它工业传感技术，比如我们为许多特殊应用而量身打造的。

5

H-LEVEL 型静力水准系统



SISGEO 拥有一个称职的、由经验丰富的工程师、技术人员、硬件专家和软件程序员组成的团队、不断地参与到生产、标定和研究等各个关键环节中。



— 生产 & 核心

SISGEO 在制造部门和实验室应用到的高品质生产设备包括：

- 装配模具：用于生产振弦传感器；
- 自动标定台：用于测斜仪，位移和压力传感器标定；
- 恒温箱：用于热处理，包括振弦式传感器的老化；
- 钨极惰性气保护电弧焊（TIG）设备；
- 半自动真空设备：用于真空除油（气）与真空负载/压力单元的填充；
- 钻孔多点移计装配生产线：最长可达 60 m；
- 液体压力机：最大输出压力可达 3000 kN；
- 压力容器：用于产品的防水能力测试；
- 自动环氧树脂涂胶机：用于仪器的密封处理。
- 自动标定台带电子控制功能，可以自动生成标定报告。

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岩土工程与结构健康监测仪器供应商 产品目录

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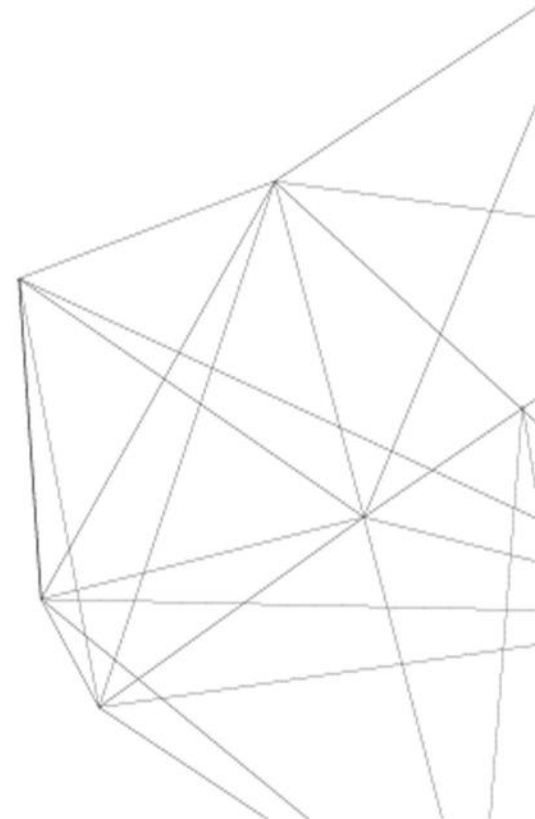
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PIEZOMETERS

渗压/渗流/水位监测仪器

_GROUND WATER LEVEL

_PORE WATER PRESSURE

_EARTHFILL DAMS
AND EMBANKMENTS

_UP-LIFT PRESSURE
IN DAM FOUNDATIONS

_SEEPAGE MONITORING

_WATER PRESSURE BEHIND
TUNNEL LININGS

_POTENTIAL LANDSLIDES

_DEWATERING AND PUMP TESTS

_FOUNDATIONS
AND DIAPHRAGM WALLS



VIBRATING WIRE PIEZOMETERS

普通型振弦式渗压计

振弦式渗压计设计用来监测土体中的孔隙水压力，它们最典型的安装方式为密封安装在钻孔中，也可以埋入到填方工程中，或者悬挂在测压井内。

STANDARD VW PIEZOMETERS 标准型 CE

型号 PK20A	with HAE value filter unit
型号 PK20S	with LAE value filter unit
标准量程	0 - 170 kPa 0 - 5.0 MPa
灵敏度	0.025% FS
精度 (MPE*)	< ±0.25% FS
工作温度	-20°C + 80°C
特征:	
- HAE	0.25 μ ceramic stone
- LAE (100kPa)	40 μ synthesized s/steel 50 μ synthesized PE
传感器直径/传感器长度	20 mm / 177 mm

HEAVY DUTY PIEZOMETERS 厚壁型 CE

型号 PK45A	with HAE value filter unit
型号 PK45S	with LAE value filter unit
标准量程	0 - 170 kPa 0 - 5.0 MPa
灵敏度	0.025% FS
精度 (MPE*)	< ±0.25% FS
工作温度	-20°C +80°C
特征:	
- HAE stone	1 μ ceramic stone
- LAE (100 kPa)	40 μ synthesized s/steel 50 μ synthesized PE (Vyon)
传感器直径/传感	27 mm / 201 mm

(*) MPE is the Maximum Permitted Error on the measuring range (FSR)

TITANIUM PIEZOMETERS

钛金属渗压计

钛金属渗压计专为高腐蚀性环境和侵蚀性土壤中的安装应用而设计。它的所有裸露在外的部位均由钛金属制成，而且使用的陶瓷膜片（压力膜）也是惰性的。

TECHNICAL SPECIFICATIONS 技术规格 CE

型号 P235TI	with HAE or LAE value filter
标准量程	200, 500 kPa, 1.0, 2.0 MPa
输出信号	4-20 mA current loop
灵敏度	0.01% FS
精度 (MPE*)	< ±0.15% FS < ±0.20% FS (for 200 kPa FS)
激励电压	12 - 24 V DC
工作温度	-20°C +80°C
特征:	
- HAE	0.25 μ ceramic stone
- LAE (100 kPa)	40 μ synthesized PE (Vyon)
传感器直径/传感器长度	27 mm / 193 mm

Sisgeo tests have verified that titanium piezometers do not have functionality or corrosion problems after one year in a solution with pH = 1 and temperature 20 °C.

OPF01SAT000 SATURATION DEVICE 饱和装置

The filter saturation is a decisive factor for a successful installation of embedded piezometers. Sisgeo provides a device for field use for the saturation of the HAE value filter (ceramic stone). It consists of a stainless steel pump with manometer and a threaded port to fit the filter unit.



PIEZO-RESISTIVE PIEZOMETERS

压阻式渗压力

压阻式渗压计和压力传感器结合了机械强度和工作性能的可靠型，能经受侵蚀性等恶劣环境。压阻式压力计适用于水位或孔隙水压力的动态测量，或者那些采用的数据采集系统不兼容振弦传感技术的场合。

TECHNICAL SPECIFICATIONS 技术规格 CE

型号 P235S1	with HAE value filter
型号 P235S4	with LAE value filter
标准量程	100, 200, 500 kPa 1.0, 2.0, 5.0 MPa
输出信号	4-20 mA current loop
灵敏度	0.01% FS
精度 (MPE*)	< ±0.15% FS < ±0.20% FS (for 100 and 200 kPa FS)
工作温度	-20°C +80°C
特征:	
- HAE	0.25 μ ceramic stone
- LAE (100 kPa)	40 μ synthesized s/steel 50 μ synthesized PE
传感器直径/传感器长度	27 mm / 193 mm

ACCESSORIES 配件

0PX PUMP0020	Pneumatic hand pump for checking the pore pressure transducers calibration.
0PX20CHECK0	Tools for 0PX PUMP0020 to allow PK20 connection

SPARE PARTS 零部件

0PF20D16000	HAE filter stone for PK20
0PF20D2000P	LAE Vyon® filter for PK20
0PF20D20000	LAE s/steel filter for PK20
0PF01D16000	HAE filter stone for PK45
0PF40D2000P	LAE Vyon® filter for PK45
0PF40D20000	LAE s/steel filter for PK45

PIEZOMETERS

渗压/渗流/水位监测仪器

_GROUND WATER LEVEL

_PORE WATER PRESSURE

_EARTHFILL DAMS
AND EMBANKMENTS

_UP-LIFT PRESSURE
IN DAM FOUNDATIONS

_SEEPAGE MONITORING

_WATER PRESSURE BEHIND
TUNNEL LININGS

_POTENTIAL LANDSLIDES

_DEWATERING AND PUMP TESTS

_FOUNDATIONS
AND DIAPHRAGM WALLS



DRIVE-IN PIEZOMETERS

贯入式渗压计

贯入式渗压计的压力传感器安装在一个不锈钢圆柱体内部，它的前端为一个锥形的尖端，外壳上可以适配贯入杆。在将其安装到土壤中（贯入）的过程中，大直径的锥形尖端可以防止任何过压现象的产生。

REMOVABLE PRESSURE TRANSDUCERS

可折缺式孔隙水压力计

可拆卸式孔隙水压力计安装在测压管（卡萨格兰德式渗压计）中，多孔质过滤花管与锥形尖端正好相互耦合。

MULTIPOINT PIEZOMETER STRING

多点式渗压力

多点式渗压计（串）由一系列连接在同一根多芯电缆上的振弦式渗压计组成，适用于要求在同一钻孔中不同深度位置进行地下水压力测试的应用。PK45M 多点式渗压计串安装埋设 - 全孔灌浆封孔法 - 防止土壤中不同层位的地下水之间形成互相连通的通道。

AVAILABLE MODELS 可用模型



型号 PK45I	VIBRATING WIRE
标准量程	0 - 350 kPa, 0 - 2.0 Mpa
灵敏度	0.025% FS
精度 (MPE*)	< ±0.25% FS
工作温度	-20°C +80°C
型号 P235I	PIEZO RESISTIVE
标准量程	0 - 200 kPa, 0 - 5.0 MPa
输出信号	4-20 mA current loop
灵敏度	0.01% FS
精度 (MPE*)	< ±0.15% FS
	< ±0.20% FS (for 200 kPa FS)
工作温度	-10°C +55°C
过滤装置	Ceramic HAE filter. Filter on request should be saturated at factory.
传感器直径/传感器长度	27 mm / 256 mm
Nose diameter	30 mm

ACCESSORIES 配件

PUSH-IN ROD OP235IROD00	Stainless steel 430 mm long tube which allows the junction with standard CPT rods. The push-in rod shall be threaded at job site and it must be reused. Length: 430 mm OD/ID: 33.7 / 29.1 mm
SATURATION DEVICE OPF01SAT000	Stainless steel pump for saturating HAE ceramic filters. Includes pump, 10 bar pressure gauge, and a threaded connection for the filters.

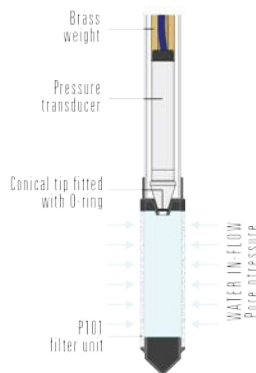
AVAILABLE MODELS 可用模型



型号 PK45C2	VW range 0-200 kPa
型号 PK45C5	VW range 0-500 kPa
输出信号	frequency (VW), resistance (T)
灵敏度	0.025% FS
精度 (MPE*)	< ±0.25% FS
工作温度	-20°C +80°C
传感器直径/传感器长度	27 mm body - 30 mm head / 230 mm
型号 P252C00200	PIEZORESISTIVE range 0-200 kPa
型号 P252C00500	PIEZORESISTIVE range 0-500 kPa
输出信号	4-20 mA current loop
灵敏度	0.01% FS
精度	< ±0.20% FS for P252C00200 < ±0.15% FS for P252C00500
工作温度	-10°C +55°C
传感器直径/传感器长度	27-30 mm / 230 mm
OP101002000	CASAGRANDE POROUS TIP

INSTALLATION DETAIL 安装详细

The transducer tip, fitted with an 'O' ring, is designed to mate to the conical port of P101 Casagrande filter unit. Sealing is maintained by ballasting weights inserted on the electric cable. A small hole on the conical tip allows pore pressure to act on the diaphragm sensor. P101 porous filter is normally installed and the transducer is then lowered into the access tube suspended by its own electro-mechanical cable until the piezometer assembly rest on the piezometer. All the transducers can be removed from the borehole by means of the electro-mechanical cable.



TECHNICAL SPECIFICATIONS 技术规格



标准量程	0 - 350 up to 3.5 MPa
输出信号	frequency (VW), resistance (T)
灵敏度	0.025% FS
精度 (MPE*)	< ±0.25% FS
工作温度	< ±0.25% FS
过滤装置	-20°C +80°C
传感器直径/传感器长度	40 μ synthesized s/steel 48.3 mm / 252 mm

SIGNAL CABLES 信号电缆

0WE1160LSZH	LSZH or PVC multicore cable (8 pairs). It permits the realization of a string of 4 VW piezometers.
0WE11600PVC	LSZH or PVC multicore cable (16 pairs). It permits the realization of a string of 8 VW piezometers.
0WE1320LSZH	
0WE13200PVC	

FULLY GROUTED INSTALLATION METHOD 装置法

The fully grouted method is gaining popularity because it is a simple, economical and accurate procedure to monitor pore water pressure in the field.

The working principle is based on the idea that a diaphragm piezometer embedded directly in a large mass of low permeability cement-bentonite grout should respond instantly to a pore water pressure change.

Grout mixes (water-cement-bentonite) are controlled to give the desired strength of the set grout. Appropriate permeability of the cement-bentonite grout is crucial for the success of the fully-grouted method.

For more details, refer to:
"Piezometers in Fully Grouted Boreholes" by Mikkelsen and Green
FMGM proceedings Oslo 2003.

(* MPE is the Maximum Permitted Error on the measuring range)

PIEZOMETERS

渗压/渗流/水位监测仪器

_GROUND WATER LEVEL

_PORE WATER PRESSURE

_EARTHFILL DAMS
AND EMBANKMENTS

_UP-LIFT PRESSURE
IN DAM FOUNDATIONS

_SEEPAGE MONITORING

_WATER PRESSURE BEHIND
TUNNEL LININGS

_POTENTIAL LANDSLIDES

_DEWATERING AND PUMP TESTS

_FOUNDATIONS
AND DIAPHRAGM WALLS



VENTED PRESSURE TRANSDUCERS

压阻式水位计

P252R是一种精密的水位（压力）传感器，它配备有通气型压阻式压力传感器，可以提供大气压变化的自动补偿。它可以用来监测测压管（卡萨格兰德式渗压计）或观测井中的地下水头。

TECHNICAL SPECIFICATIONS 技术规格

标准量程	100, 200, 500 kPa, 1.0 MPa
输出信号	4-20 mA current loop
灵敏度	0.01% FS
精度 (MPE*)	< ±0.25% FS
激励电压	12 - 24 V DC
超压	1.3 x FS
热零点漂移	0.00025% FS / °C
工作温度	-10°C +55°C
过滤装置	synthesized stainless steel or Vyon*
材质	stainless steel
传感器直径/传感器长度	27 mm / 191,5 mm
电缆	0WE203KEOZH

ACCESSORIES 配件

SUPPORT HEAD OP200CH1000	Lockable support head assembly with data plate. Positioned on the top of the standpipe permits to suspend the transducer by a secure cable stop.
VENTED BOX OEPDP002W00	Vented IP67 plastic box equipped with overvoltage protections and cable glands.

(*) MPE is the Maximum Permitted Error on the measuring range (FSR)



STAFF GAUGES

水位标尺

水位标尺（水尺）用来对水库、江河、溪流或明渠等地表水体水位进行快速的、直观的目视观测。

水为标尺采用坚固的铸铁材料制造，外表面完整地涂覆了搪瓷材料，以防止其生锈和褪色，并确保读数简单易行。

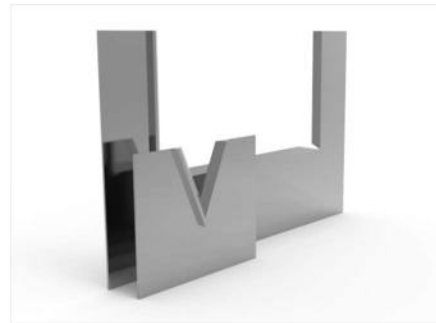
每一根水尺都带有准确的刻度，并留有安装孔，方便将其固定在墙壁、支墩或其他结构物上。

STANDARD COMPONENTS 标准构

STAFF GAUGE OHIDR1000S0	Hydrometric rod 1 meter long, black and white colors. It is divided into centimeters with each decimeter numbered. Rods for any elevation may be assembled. Separate number plates are available to show elevation. Available also in different colors on request.
FIGURE PLATE OHIDR1310P0	Number plate with three (3) figures wich represent elevation. The three figures are on white porcelain enameled plate. Using a combination of these figures any elevation may be represented. Available also in different colors on request.

SPECIAL PARTS 特殊部分

INCLINED STAFF GAUGES	They are customized gauges for installation on inclined surface such as upstream face of dams or concrete lined irrigation channels. Mounted flush on the sloped sides, these staff gauges give a direct reading of the vertical stage height.
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SEEPAGE MEASUREMENTS WEIR MONITORING

三角（V型）量水堰

量水堰的目的是为了将瞬时的流量通过特殊的测量设备转化成为压力/水位值。

在低流量状态下，三角（V形）量水堰对堰口水头高度的灵敏度要比矩形量水堰更好。

V-NOTCH WEIRS 量水堰

The purpose of the weir is to transform the instantaneous flow values into the pressure/level by means of specific measuring equipment. V-notch weirs are preferred for low discharges as the head above the weir crest is more sensitive to changes in flow compared to rectangular weirs.

0QV45LS1000	10 litre/sec, V-angle 45°
0QV60LS2000	20 litre/sec, V-angle 60°
0QV90LS5000	50 litre/sec, rectangular

WATER LEVEL TRANSDUCER 水位传感器

The V-notch water level transducer consists of a highly sensitive relative pressure sensor with 2 m vented cable and junction box with 3 levels of overvoltage protection.

0QVML0500EX	Level transducer, range 0-500mm
0QVML1000EX	Level transducer, range 0-1000mm

传感器型号	relative pressure transducer
测量范围	500 or 1000 mm H2O
精度	±0.1 mm H2O
输出信号	4-20 mA current loop
激励电压	12 - 24 V DC
工作温度	-10°C to +80°C

ACCESSORIES AND SPARE PARTS 配件及备件

0QVHI030000	Staff gauge for V-notch 300 mm long, millimetre division
0QVHI050000	Staff gauge for V-notch 500 mm long, millimetre division
OP252000000	Spare pressure transducer 500 or 1000 mm H ₂ O
OEPDP002W00	Spare junction box with OVP

PIEZOMETERS

渗压/渗流/水位监测仪器

_GROUND WATER LEVEL

_PORE WATER PRESSURE

_EARTHFILL DAMS
AND EMBANKMENTS

_UP-LIFT PRESSURE
IN DAM FOUNDATIONS

_SEEPAGE MONITORING

_WATER PRESSURE BEHIND
TUNNEL LININGS

_POTENTIAL LANDSLIDES

_DEWATERING AND PUMP TESTS

_FOUNDATIONS
AND DIAPHRAGM WALLS



WATER LEVEL INDICATORS (WLI)

电测水位计

电测水位计 (WLI) 用来测量观测井、测压管 (卡式渗压计) 中的水位埋深。

C112T型电测水位计 (WLI) 带有温度读数功能和数字显示器, 可测量水位和水温。

C112电测水位计 (WLI) 型: 只能测量水位。

AVAILABLE MODELS 可用模型

型号 C112	flat cable with marks at every millimetre
探头	water level detector
电缆长度	30, 50, 100 m
	150, 200, 300, 400, 500 m
探头直径	16 mm
电池	1 x 9V DC disposable
型号 C112T	flat cable with marks at every millimetre
探头	water level detector and temperature sensor
电缆长度	30, 50, 100 m
	150, 200, 300, 400, 500 m
拔禾轮直径	260 mm, 320 mm, 420 mm
探头直径	16 mm
显示屏	3.5 LCD (only for C112T)
电池	2 x 9V DC disposable

PROBE SPARE PARTS 探头备件




0C112KITR00	Probe spare set for the model C112 including sensor probe weights and epoxy.
0C112TKITR0	Probe spare set for the model C112T including sensor probe weights and epoxy.



STANDPIPE AND CASAGRANDE PIEZOMETERS 卡萨格兰德测压管

测压管, 即竖管式孔隙水压力计, 它是一种开口管的测压方式 (由卡萨格兰德创用), 应用于垂直钻孔内的孔隙水压力水头监测。测压管由两部分组成: 一个多孔质的过滤花管 (一般位于底部) 和一系列连续的直到钻孔顶部的立管。多孔质过滤花管必须定位于钻孔中一个由中粗砂填充的过滤区段内, 过滤区段和上部的回填土之间必须用膨润土 (粘土球) 进行密封止水。

AVAILABLE MODELS 可用模型

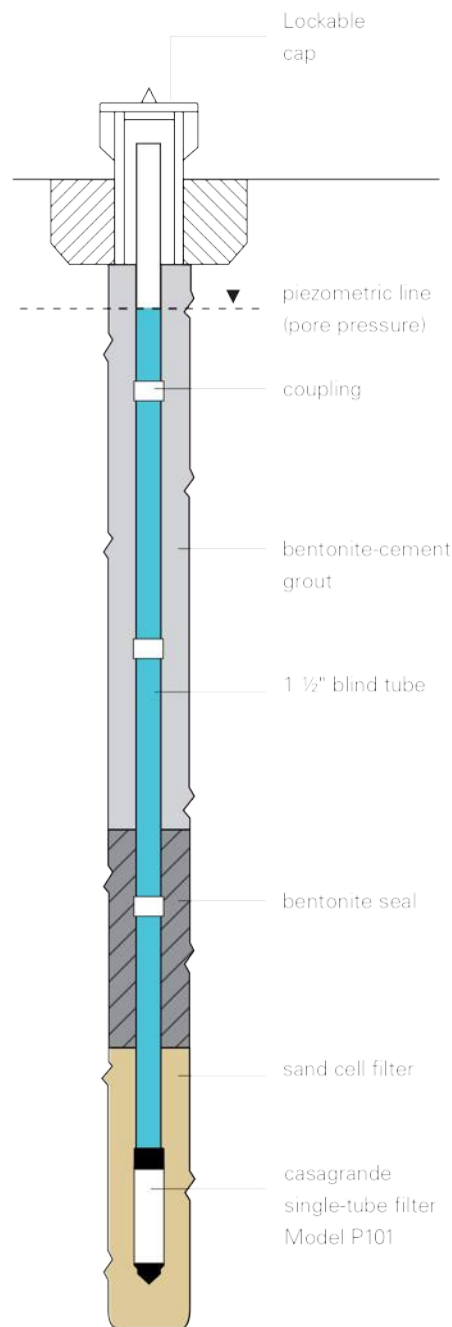
P101		Casagrande/standpipe 40 µ porous tip 1-half inch single tube connection Length: 200 mm Outer diameter: 61.5 mm
P112		Casagrande 40 µ porous tip half inch twin tubes connection Length: 200 mm Outer diameter: 61.5 mm
TFH		Standpipe filter unit PVC slotted tube with fabric Available diameters: 1, 1 1/2 and 2-inch Length: 3 meter

ACCESSORIES 配件

LOCKABLE CAP 0P100CH1000	Equipped with an identification plate and a topographic pin, the lockable cap ensures protection at the top end of Casagrande and standpipe piezometers.
BENTONITE PELLETS 1000BE20025K	Supplied in 25 Kg bags, the pellets work as a watertight sealant inside the borehole of the piezometer filter unit.

EXAMPLE OF CASAGRANDE PIEZOMETERS

卡萨格兰德测压管的例子



INCLINOMETERS

倾斜/倾角观测仪器

- _ LANDSLIDES
- _ DAMS
- _ UNSTABLE SLOPES
- _ PILES
- _ DIAPHRAGM WALLS
- _ TUNNELING
- _ DEEP EXCAVATIONS
- _ BRIDGES AND VIADUCTS
- _ EMBANKMENTS



B.R.A.IN INCLINOMETER SYSTEMS

数字式测斜仪

B.R.A.IN (Borehole Readout Array for InclInometers)

系统主要由数字测斜仪、带控制电缆的蓝牙卷轴和与Android 和 iOS 设备兼容的B.R.A.IN应用组成。直观的B.R.A.IN 应用允许用户管理测斜仪和螺旋仪测量，并立即与设备上安装的最流行的共享读数 应用。

VERTICAL SYSTEMS PERFORMANCES 垂直系统性能

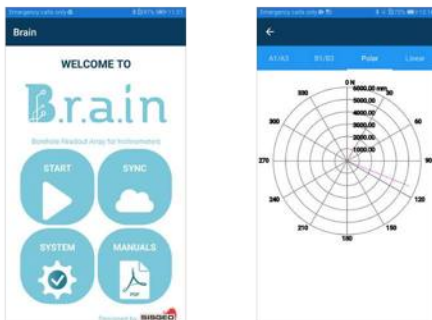
读出值	20000 sin alpha (other values available on request)
系统分辨率	
with 500 mm gauge length	0.011 mm / 500 mm
with 1000 mm gauge length	0.023 mm / 1000 mm
重复性 (精度) ¹	
with 500 mm gauge length	± 1.5 mm / 30 m
with 1000 mm gauge length	± 2.0 mm / 30 m

HORIZONTAL SYSTEMS PERFORMANCES 水平系统性能

读出值	20000 sin alpha (other values available on request)
系统分辨率	
with 500 mm gauge length	0.011 mm / 500 mm
with 1000 mm gauge length	0.023 mm / 1000 mm
重复性 (精度) ¹	
with 500 mm gauge length	± 7.0 mm / 30 m
with 1000 mm gauge length	± 10.0 mm / 30 m

(1) As for ISO 18674-3, this is the "difference between the cumulated displacements of a measuring point relative to a reference point 30 m apart, when repeatedly carrying out the survey under repeatability conditions."

B.R.A.IN APP 应用



Two example of screenshot

两个截屏例子



VERTICAL MEMS PROBE

垂直 测斜仪

测扭仪探头用来确定测斜管的方位角变化，扭转是一个与测斜管制造工艺、接头装配以及安装工艺等因素相关的函数。对测斜管的扭转校正可以提高测斜数据的准确性，并提供更确切的解释。

OS242DV3000 VERTICAL PROBE 垂直 测斜仪 CE

测量范围	±30°
传感器型号	biaxial digital MEMS
输出信号	RS-485 with Modbus RTU protocol
传感器分辨率 @ 2 Hz	0.00056° ±0.0015% FS (±0.015 mm/m)
精度 (MPE*)	±0.01% FS
工作温度	-30°C to +70°C
材质和直径	stainless steel, 28 mm
测量仪长度 (总长)	500mm (750mm), 1000mm
轮子	(1250mm) 2 spring-loaded carriages with 2 wheels each
IP 速度	IP68 up to 2.0 MPa

(* MPE is the Maximum Permitted Error on the measuring range (FSR)

OPERATIONS 行动

At the beginning of a survey, the probe shall be brought to the point furthest from the collar of the inclinometer tube and left there to adjust to the ambient temperature. The probe shall then be moved sequentially to each respective measuring point in the direction of collar of the tube. On reaching the collar of the guide tube, the probe is removed from the guide tube, rotated by 180°, returned to the measuring point that is furthest from the collar of the guide tube and the sequence is repeated in the reversed position to complete the inclinometer survey.

ACCESSORIES 配件

OS1ST000000	Test (dummy) probe
OS1CSU10000	Pulley assembly
OS1CSU20000	Simple cable stop
OS0WCAL1000	Calibration frame
OKL10NSW000	KLION data analysis software



HORIZONTAL MEMS PROBE

水平测斜仪

数字水平探头允许对水平安装的套管进行监测。它具有500毫米和1000毫米规格长度。水平倾斜仪比任何其他沉降剖面测量系统提供了更准确和可重复的读数。它用于测量路基、油罐和道路下的沉降或隆起。

OS241DH3000 HORIZONTAL PROBE 水平测斜仪 CE

测量范围	±30°
传感器型号	uniaxial digital MEMS
输出信号	RS-485 with Modbus RTU protocol
传感器分辨率 @ 2 Hz	0.00056° ±0.0015% FS (±0.015 mm/m)
重复性	±0.0015% FS (±0.015 mm/m)
精度 (MPE*)	±0.01% FS
工作温度	-30°C to +70°C
材质和直径	stainless steel, 28 mm
测量仪长度 (总长)	500mm (810mm), 1000mm (1310mm)
轮子	2 fixed wheels and 2 spring-loaded wheels
IP 速度	IP68 up to 2.0 MPa

OPERATIONS 行动

The survey may be taken within a horizontal inclinometer casing installed either with "both sides open" or with "one end closed" by means of a dead end pulley.

The initial measure establishes the profile of the casing and the subsequent measures detect changes in the profile related to the ground movements.

Settlement and heave are calculated at each measurement interval, and the settlement profile is generated by summing displacements.

ACCESSORIES 配件

OS20H0R0D00	Inclinometer connecting rod
OREXR0D10BX	Set of 10 positioning rod (2 m)
OREXR0D2000	Positioning rod, 2 m
0WRACPVC000	Dragging steel wire, PVC jacket
OS1RINV7000	Dead end pulley, 70 mm OD casing
OS1RINV7500	Dead end pulley, 3" casing

INCLINOMETERS

倾斜/倾角观测仪器

- _ LANDSLIDES
- _ DAMS
- _ UNSTABLE SLOPES
- _ PILES
- _ DIAPHRAGM WALLS
- _ TUNNELING
- _ DEEP EXCAVATIONS
- _ BRIDGES AND VIADUCTS
- _ EMBANKMENTS



B.R.A.IN BLUETOOTH CABLE REEL

蓝牙卷筒电缆

B.R.A.IN电子读数集成在电缆卷筒中，可与HD重型电缆或轻型电缆一起使用。

The BLE (Bluetooth Low Energy) 无线协议允许以非常低的电池消耗与管理设备进行快速和安全的通信。

B.R.A.IN REEL SPECIFICATIONS 卷筒规格CE

通信设备	BLE (Bluetooth Low Energy) 4.2
载传感器	Temperature, humidity, voltage
工作温度	-40 to 80°C (batteries -20 to 65°C)
探头通信	RS485 Modbus RTU Protocol
IP 速度	IP65
工作时间	≈96 h (with inclinometer and spiral probe)
通知软键背光LED	Different colors for local notifications

小型设备	Bluetooth Low Energy BLE 4.2
规格	ANDROID OS V.7 or higher
(SISGEO 没有提供)	APPLE iOS 11 or higher



AVAILABLE MODELS

OS2RC6000B0	HD (HEAVY DUTY) CABLE
工作温度	-30 to 80 °C
重量	14 kg with reel and 60 m cable
电缆长度	30, 60, 100, 150 m
导体	6x0.50 mm ²
触觉深度标记	copper, every 500 mm
OS2RD6000B0	LIGHT CABLE
工作温度	-30 to 80 °C
重量	6 kg with reel and 60 m cable
电缆长度	30, 60, 100, 150, 200 m
导体	2x0.50 + 2x0.22 mm ²
触觉深度标记	aluminum, every 500 mm



DIGITAL SPIRAL METER

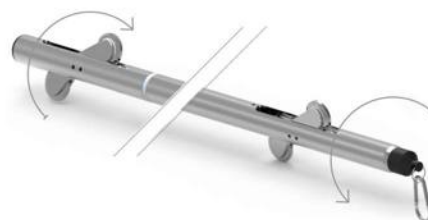
测扭仪

数字螺旋仪用于确定安装的测斜仪套管的方位已正确安装。螺旋是一个功能的制造工艺，联轴器和安装技术。螺旋校正提高了数据的准确性和更可靠的数据解释。

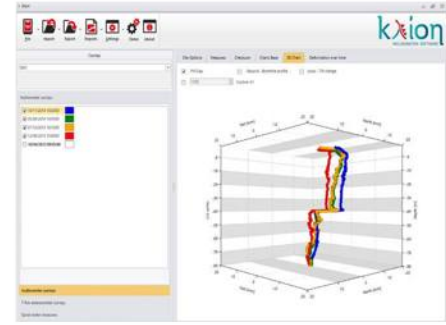
OS30PR12D00 DIGITAL SPIRAL PROBE 数字螺旋探头 CE

通信设备	±5° over wheels base (1000 mm)
载传感器	rotary contactless potentiometer (magneto-resistive)
分辨率	0.01°
精度	< ±0.5% FS
电源	± 2.5 V DC
直径	28 mm
长度	1250 mm (without connector)
轴距	1000 mm
连接器	water tight, 6 pins

Digital spiral probe is fully compatible with B.R.A.IN bluetooth reel and APP. With KLION software, spiral probe data shall be inserted into the calculation in order to compensate inclinometer data with tube twisting data. Sisgeo suggests to take spiral data with the inclinometer zero reading for the data correction considering the casing twisting due to installation procedures.



Spiral probe: twisting on the probe axis for measuring the inclinometer casing torsion













KLION ANALYSIS SOFTWARE

KLION 分析软件

KLION是一个专门设计的软件，用来处理来自垂直和水平钻孔的测斜仪和 T-Rex伸缩仪数据，提供图表和报告。数据文件可以通过手动数据输入或直接从阿基米德或B.R.A.IN读出。高级数据分析可使用Mikkelsen建议 (FMGM 2003)

SOFTWARE MAIN FEATURES 软件主要特点

-  User - oriented interface for managing most operations with "point and click"
-  Set-up and manage both vertical and horizontal readings
-  Automatic compensation of the inclinometer data with spiral meter survey
-  Customizable report file with advanced Word Processor
-  Charts zoom-in or zoom-out with a simple mouse scroll
-  For inclinometers, customisable charts of deformation over time are available
-  With KLION you can view the inclinometer data elaborations in a 3D graph
-  Geolocation with Google Map tool and main displacement vectors
-  On-line automatic software updates if connected to the internet
-  Multilanguage software now available in English and Italian. More languages in the next revision.

OPERATIVE SYSTEM REQUIREMENTS 工作系

KLION works on Microsoft © Vista, 7, 8, 8.1 and 10 (32 and 64 bit)
HW minimum requirement: RAM 512 MB, HD 100 MB

INCLINOMETERS

倾斜/倾角观测仪器

- _LANDSLIDES
- _DAMS
- _UNSTABLE SLOPES
- _PILES
- _DIAPHRAGM WALLS
- _TUNNELING
- _DEEP EXCAVATIONS
- _BRIDGES AND VIADUCTS
- _EMBANKMENTS



STANDARD INCLINOMETER CASINGS

标准倾斜仪斜管

铝或ABS测斜仪套管是特殊的槽管，通常安装在钻孔中，并与测斜仪系统一起使用，以确定地下地面或水平土壤运动。

ABS测斜仪外壳可跟标准或快速锁定（QL）联轴器采用；QL模式允许更快和更容易的安装。

ALUMINIUM INCLINOMETERS 铝倾斜仪

型号	S1110075	S1110054
材质	Aluminium	Aluminium
测斜管外径	86.4 mm	58.0 mm
测斜管内径	76.1 mm	49.0 mm
沟槽内径	82.0 mm	54.0 mm
测斜管总长度	3 meter	3 meter
重量	1.4 kg/m	0.92 kg/m
螺旋形	<1.0°/ 3 m	<1.0°/ 3 m
Coupling O.D.	92.0 mm	62.6 mm

STANDARD ABS INCLINOMETERS 标准倾斜

型号	S13100603M	S13100610F
材质	ABS plastic	ABS plastic
测斜管外径	71.0 mm	71.0 mm
测斜管内径	60.0 mm	60.0 mm
沟槽内径	64.0 mm	64.0 mm
测斜管总长度	3 m	10 ft
重量	0.7 kg/m	0.21 kg/ft
螺旋形	<0.6°/ 3 m	<0.6°/ 10 ft
Coupling 外径	77.0 mm	77.0 mm
Coupling 长度	200 mm	200 mm

QUICK LOCK ABS INCLINOMETERS QL模式

型号	S131QL603M	S131QL610F
材质	ABS plastic	ABS plastic
测斜管外径	71.0 mm	71.0 mm
测斜管内径	60.0 mm	60.0 mm
沟槽内径	64.0 mm	64.0 mm
测斜管总长度	3 m	10 ft
重量	0.7 kg/m	0.21 kg/ft
螺旋形	<0.6°/ 3 m	<0.6°/ 10 ft
Coupling 外径	77.0 mm	77.0 mm
Coupling 长度	200 mm	200 mm



EASY LOCK AND QUICK-JOINT ABS CASINGS

QJ 型快速接头式测

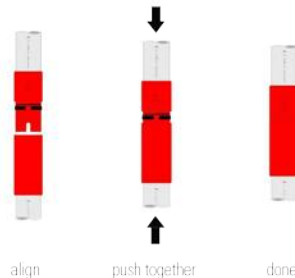
QJ 型快速接头式测斜管包含了快速接头，内置快速扣合、连接两节测斜管的耦合器。接头处的 O 型圈可以确保接头在钻孔灌浆时的防水性。

OS143107000 EASY LOCK INCLIN. CASING 易锁

材质	ABS plastic
测斜管外径	70 mm
测斜管内径	58 mm
沟槽内径	63,5 mm
测斜管总长度	3055 mm (casing + coupling)
测斜管总重量	3.6 kg (casing + coupling)
螺旋形 (1)	<0.2° / m
倒塌试验 (2)	15 bar
HDT test ISO 75	+83°C

OS151107000 QJ INCLINOMETER CASING QJ 型测斜管

材质	ABS plastic
测斜管外径	70 mm
测斜管内径	59 mm
测斜管总长度	3100 mm
总直径	84 mm
颜色	white / red
螺旋形 (1)	<0.6°/ 3 m
倒塌试验 (2)	15 bar
工作温度	-20°C +80°C



(1) During manufacturing a particular attention is paid to minimise the spiral of the casing grooves and to machine the aligning key for casing junction with self-aligning couplings.

(2) Test was performed in a water pressure chamber with empty casing sealed at the two ends.



COMBINED INCLINOMETER AND SETTLEMENT MEASUREMENT

组合式测斜仪与沉降测

倾角仪和沉降测量可以结合在同一个钻孔或堤防中。该系统由装有伸缩联轴器的ABS测斜仪外壳和带有永磁体的沉降环组成。沉降环可在钻孔或圆形板堤防弹簧蜘蛛安装。

ACCESSORIES FOR EASY LOCK CASING 易锁套管附件

OS143107000	TELESCOPIC SECTION 3 meter section with 70 or 150 mm gap
OS131AF6000	SPIDER MAGNET RING Used in borehole with spring legs
OS131AR6000	EMBANKMENT MAGNET RING Used in fill with plate, OD 300 mm

ACCESSORIES FOR QJ CASING QJ套管附

OS151MT0700	QJ TELESCOPIC COUPLING 500 mm long with 75 mm gap
OS151DR7000	QJ DATUM REFERENCE SECTION Bottom section with datum magnet
OS151AF8000	SPIDER MAGNET RING, ID 83 MM Used in borehole with spring legs
OS151AR8000	EMBANKMENT MAGNET RING Used in fill with plate, OD 300 mm

MEASUREMENTS 测量

Manual readings are carried out lowering inside the casing:

- the inclinometer probe for monitoring the horizontal movements;
- the portable magnet extensometer readout model C121 with millimetre tape for detecting settlements.

INCLINOMETERS

倾斜/倾角观测仪器

- _ LANDSLIDES
- _ DAMS
- _ UNSTABLE SLOPES
- _ PILES
- _ DIAPHRAGM WALLS
- _ TUNNELING
- _ DEEP EXCAVATIONS
- _ BRIDGES AND VIADUCTS
- _ EMBANKMENTS



MEMS IN-PLACE INCLINOMETERS 固定式测斜仪

固定式倾斜计（模拟信号 IPI）用来进行一个连续的钻孔剖面上的水平位移监测，由碳纤维延长杆或者不锈钢连接杆串联在一起。

AVAILABLE MODELS 可用模型



型号 S411HA	uniaxial
型号 S412HA	biaxial
传感器型号	self compensated MEMS
标准量程	$\pm 10^\circ, \pm 15^\circ, \pm 20^\circ, \pm 30^\circ$
传感器分辨率 @ 2 Hz	0.00056° (0.01 mm/m)
精度 (MPE*)	$< \pm 0.05\% \text{ FS}$
总体精度	$< \pm 0.005\% \text{ FS } / ^\circ\text{C}$
输出信号	4-20 mA current loop
激励电压	18 - 30 V DC
工作温度	-30°C to +70°C
温度传感器	Built-in thermistor
防护等级	IP68 up to 1.0 MPa

PROBE FEATURES 探头类型

外径	30 mm
轴距	1000 mm
总长度	1230 mm
材质	s/steel and thermoplastic resin
防护等级	IP68 up to 1.0 MPa

ACCESSORIES 配件

OS4TS101000	In-place inclinometer support head
OS4IP1T00L0	In-place inclinom. clamping tool
OWRAC200000	Stainless steel support wire, 2 mm
OWE1061P0ZH	6 wires IPI cable, LSZH

(*MPE is the Maximum Permitted Error on the measuring range (FSR))



BH PROFILE (ANALOGUE IPI) BH剖面 (模拟信号 IPI)

这些IPIs用于位移监测需要连续钻孔剖面。IPI探头有不锈钢和热塑性树脂组件跟一个固定轮（靠近接头）和一个弹簧加载轮。IPI与碳纤维延长杆连接在一起用以确保垂直安装的轻度和水平应用的刚度。

AVAILABLE MODELS 可用模型



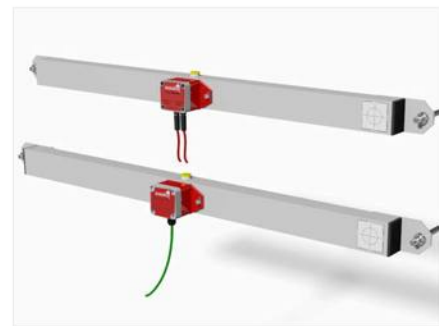
型号 S431HA	uniaxial, vertical installation
型号 S432HA	biaxial, vertical installation
型号 S441HA	uniaxial, horizontal installation
标准量程	self compensated MEMS
标准量程	$\pm 10^\circ, \pm 15^\circ, \pm 20^\circ, \pm 30^\circ$
传感器分辨率 @ 2 Hz	0.00056° (0.01mm/m)
精度 (MPE*)	$< \pm 0.05\% \text{ FS}$
	$< \pm 0.005\% \text{ FS } / ^\circ\text{C}$
输出信号	4-20 mA current loop
激励电压	18 - 30 V DC
工作温度	-30°C to +70°C
防护等级	IP68 up to 1.0 MPa

PROBE FEATURES 探头类型

传感探头直径	30 mm
传感探头材质	s/steel and thermoplastic resin
防护等级	IP68 up to 1.0 MPa
延长杆	Carbon fiber, 20 mm OD

ACCESSORIES 配件

OS430EX10RD	1 m carbon-fibre extension rod
OS430EX20RD	2 m carbon-fibre extension rod
OS430EX30RD	3 m carbon-fibre extension rod
OS43WHE2SS0	Terminal wheels assembly
OWRAC250000	s/steel support wire Ø 2.5 mm
OS4TS101000	Vertical IPI support head
ODEXOTS2350	Horizontal IPI protective cap
OWE1061P0ZH	6 wires IPI cable, LSZH



TILT BEAM 电水平梁 SENSORS

电水平梁倾斜计的传感元件为一MEMS倾斜计，它被装配在一个定义了安装基距的铝制刚性横梁内。应用时，将横梁的两端固定结构物上，这种装置将倾斜角度的变化转换成为位移变化，可以应用于沉降或隆起等方面的监测。在水平方向进行链式安装时，建议使用数字式电

TILT BEAM SENSORS 电水平梁



型号 S541MA	uniaxial tilt sensor
型号 S542MA	biaxial tilt sensor
应用	horizontal, vertical or inclined
传感器型号	self compensated MEMS
标准量程	$\pm 5^\circ, \pm 10^\circ$
传感器分辨率	0.00056° (0.01mm/m)
总数精度 (*)	$< \pm 0.07\% \text{ FS with } \pm 5^\circ \text{ FS}$
	$< \pm 0.05\% \text{ FS with } \pm 10^\circ \text{ FS}$
输出信号	4-20 mA current loop
激励电压	18 - 30 V DC
工作温度	-30°C to +70°C
防护等级	IP67

DIGITAL TILT BEAM SENSOR



数字式倾斜光束传感器

型号 S541HD	uniaxial digital tilt sensor
型号 S542HD	biaxial digital tilt sensor
应用	horizontal, vertical or inclined
传感器型号	digital self compensated MEMS
标准量程	$\pm 5^\circ, \pm 10^\circ$
传感器分辨率	0.00056° (0.01 mm/m)
标准量程 (*)	$< \pm 0.015\% \text{ FS with } \pm 5^\circ \text{ FS}$
	$< \pm 0.010\% \text{ FS with } \pm 10^\circ \text{ FS}$
输出信号	RS485, MODBUS RTU protocol
激励电压	12 - 24 V DC
工作温度	-30°C to +70°C
防护等级	IP67

BEAMS

OS7BM100000	1 meter beam
OS7BM200000	2 meter beam
OS7BM300000	3 meter beam
材质	Aluminium
梁截面	40 x 60 mm (WxH)

INCLINOMETERS

倾斜/倾角观测仪器

- _ LANDSLIDES
- _ DAMS
- _ UNSTABLE SLOPES
- _ PILES
- _ DIAPHRAGM WALLS
- _ TUNNELING
- _ DEEP EXCAVATIONS
- _ BRIDGES AND VIADUCTS
- _ EMBANKMENTS



SURFACE TILTMETERS

表面式倾角计 (数字式)

数字式 (MEMS) 倾角计使用数字式的MEMS 倾斜传感器, 可以在结构表面沿水平或垂直方向永久安装, 进行长期监测。

数字式倾角计设计用来监测垂直于安装基座表面的一个或两个轴平面上的倾斜变化。

SISGEO 提供防水的总线式连接器, 可以简单快捷地将多个数字式倾角计进行串联监测。

AVAILABLE MODELS 可用模型



型号 S541MA	uniaxial
型号 S542MA	biaxial
传感器型号	self compensated MEMS
标准量程	$\pm 2.5^\circ, \pm 5^\circ, \pm 10^\circ$
传感器分辨率@ 2 Hz	0.00056° (0.01 mm/m)
精度 (MPE*)	$< \pm 0.07\% \text{ FS with } \pm 2.5^\circ, \pm 5^\circ \text{ FS}$ $< \pm 0.05\% \text{ FS with } \pm 10^\circ \text{ FS}$
温度敏感性	$\pm 0.005\% \text{ FS } / ^\circ\text{C}$
输出信号	4-20 mA current loop
电源	18 - 30 V DC
工作温度	-30°C to +70°C
整体尺寸	95 x 60 x 52 mm (LxWxH)
材质和防护等级	aluminium, IP67

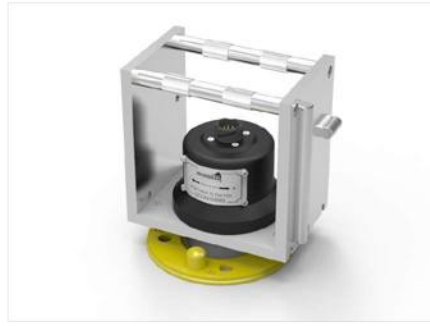
ACCESSORIES 配件

0S540AP3D00	Fine adjustment base plate especially recommended for small ranges ($\pm 2.5^\circ$ and $\pm 5^\circ$)
0EPM0101P10	Junction box for digital sensor chains Measuring box for digital sensors chain

SERVO-ACCELEROMETER TILTMETERS



信号 S530SV	uniaxial or biaxial
传感器型号	gravity referenced servo inclinometer
可用范围	$\pm 5^\circ, \pm 14.5^\circ$
非线性	$\pm 0.02\% \text{ FS (least squares method)}$
温度漂移	$\pm 0.002\% \text{ FS } / ^\circ\text{C}$
工作温度	-20°C to +80°C
整体尺寸	128 x 130 x 195 mm (LxWxH)
防护等级	IP67



TILLI PORTABLE TILTMETER 便携式倾角计

TILLI 是一款坚固耐用的便携式倾角计, 它的传感元件为内置在铝制保护壳中的带有自补偿功能的 MEMS 倾斜传感器, 其外部为一个牢固的不锈钢框架。不锈钢框架底部的测量基座为精密的机械加工部件, 可以在连续测量时保证该倾角计的准确定位。一台 TILLI 便携式倾角计可用于若干预装有倾斜测量基座的测量点。

0SCLIN150H0 TILTMETER 倾角仪



TILLI sensor	uniaxial self compensated MEMS
测量范围	$\pm 15^\circ$ from the vertical
传感器分辨率 @ 2 Hz	0.00056° (0.01 mm/m)
重复性	$< \pm 0.003^\circ$
温度敏感性	$< \pm 0.005\% \text{ FS } / ^\circ\text{C}$
工作温度	-30°C to +70°C
材质	Stainless steel frame anodised AL sensor housing
重量	3 Kg (TILLI only)
携带箱	IP68 shock-resistant plastic



Measuring activity with TILLI

0SCLTP14B00 TILT PLATE

材质	Brass
尺寸 (OD x thickness)	135 x 23 mm

Stainless steel cover available as option (code 0SCLTC14000)



SUBMERSIBLE MEMS TILTMETERS 防水型倾角计

潜水倾角计是为在水位以下或洪水的地方进行就地应用而设计的。可调式倾角计装备在基板上有MEMS传感器并安装, 用于监测一个两个轴垂直于基板表面向平面的倾斜变化。

AVAILABLE MODELS 可用模型



型号 S521MA	uniaxial
型号 S522MA	biaxial
传感器型号	self compensated MEMS
标准量程	$\pm 5^\circ, \pm 10^\circ$
传感器分辨率@ 2 Hz	0.00056° (0.01 mm/m)
精度 (MPE*)	$< \pm 0.07\% \text{ FS with } \pm 5^\circ \text{ FS}$ $< \pm 0.05\% \text{ FS with } \pm 10^\circ \text{ FS}$
温度敏感性	$< \pm 0.005\% \text{ FS } / ^\circ\text{C}$
输出信号	4-20 mA current loop
电源	18 - 30 V DC
工作温度	-30°C to +70°C
整体尺寸	36 x 68 x 245 mm (LxWxH)
材质和防护等级	stainless steel, IP68 until 1.0 MPa

ACCESSORIES 配件

0S500PF1000	Stainless steel base plate with three anchors for wall mounting. Overall diam: 100 mm
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0S500AP3600	"L" shaped base plate for installation of submersible tilt meters on sloped surface.
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(*) MPE is the Maximum Permitted Error on the measuring range (FSR)

INCLINOMETERS

倾斜/倾角观测仪器

- _ LANDSLIDES
- _ DAMS
- _ UNSTABLE SLOPES
- _ PILES
- _ DIAPHRAGM WALLS
- _ TUNNELING
- _ DEEP EXCAVATIONS
- _ BRIDGES AND VIADUCTS
- _ EMBANKMENTS



DIGITAL MEMS IN-PLACE INCLINOMETERS 数字式 MEMS 测斜仪 (IPI)

这种型号的数字式 MEMS 测斜仪 (IPI) 具有双托架, 允许在需要的深度处连续安装探头。IPI 通过钢丝悬挂在套管中, 用于单根数字电缆连接在一起。读数可以用手动携带便携式读数或自动与 OMNIALOL 数据记录器。

AVAILABLE MODELS 可用模型 CE

型号 S411HD	vertical uniaxial
型号 S412HD	vertical biaxial
传感器型号	self compensated MEMS
测量范围	$\pm 10^\circ, \pm 15^\circ, \pm 30^\circ$
传感器分辨率@ 2 Hz	0.00056° (0.01mm/m)
精度 (MPE*)	$< \pm 0.01\% \text{ FS with } \pm 10^\circ, \pm 15^\circ \text{ FS}$ $< \pm 0.015\% \text{ FS with } \pm 30^\circ \text{ FS}$
传感器温度	$< \pm 0.005\% \text{ FS } / ^\circ\text{C}$
电源	12 - 24 V DC
输出信号	RS485, MODBUS RTU protocol
工作温度	-30°C to +70°C
防护等级	IP68 up to 1.0 MPa

PROBE FEATURES 探头类型

外径	28 mm
轴距	1000 mm
总长度	1230 mm
材质	s/steel and thermoplastic resin
防护等级	IP68 up to 1 MPa

ACCESSORIES 配件

OS4TS101000	In-place inclinometer support head
OWRAC250000	S/steel support wire 2.5 mm OD
OS400HD001C	Interprobe cable (digital cable with two IP68 connectors and s/steel wire) available different lengths (2 m, 5 m, 10 m and 15 m)
OEC0N04MV00	digital IPI connector
OWE6061PD2H	digital IPI cable



BH PROFILE (DIGITAL IPI)

数字式 BH 型

数字式 BH 型提供了对土体变形的套管连续远程监测。BH型材链由许多带有碳纤维延伸杆的数字IPI和端子轮组件组成, 用于关闭链。单根数字电缆将系统连接到OMNIAlog, 用于远程数据管理、实时监控和警告。

AVAILABLE MODELS 可用模型 CE

型号 S431HD	vertical uniaxial
型号 S432HD	vertical biaxial
型号 S441HD	horizontal uniaxial
传感器型号	self compensated MEMS
测量范围	$\pm 10^\circ, \pm 15^\circ, \pm 30^\circ$
传感器分辨率@ 2 Hz	0.00056° (0.01 mm/m)
精度 (MPE*)	$< \pm 0.01\% \text{ FS with } \pm 10^\circ, \pm 15^\circ \text{ FS}$ $< \pm 0.015\% \text{ FS with } \pm 30^\circ \text{ FS}$
传感器温度	$< \pm 0.005\% \text{ FS } / ^\circ\text{C}$
电源	12 - 24 V DC
输出信号	RS485, MODBUS RTU protocol
工作温度	-30°C to +70°C
防护等级	IP68 up to 1.0 MPa

PROBE FEATURES 探头类型

Sensed probe diameter	30 mm
Sensed probe material	s/steel and thermoplastic resin
Protection	IP68 up to 1 MPa
Extension rod	Carbon fiber, 20 mm OD

ACCESSORIES 配件

OS430EX10RD	1 m carbon-fibre elongation rod
OS430EX20RD	2 m carbon-fibre elongation rod
OS430EX30RD	3 m carbon-fibre elongation rod
OS43WHE2SS0	Terminal wheels assembly
OS4TS101000	Vertical IPI support head
ODEX01S2350	Horizontal IPI protective cap
OWRAC250000	s/steel support wire, 2.5 mm



D-TILTMETERS D 式倾角计

D 式倾角计采用数字MEMS倾斜传感器。它们被设计成水平或垂直的永久安装, 以提供长期的测量。D 式倾角计用于监测一个或两个轴垂直于基板表面向平面的倾斜变化。还有, 防水连接器提供了简单和容易串联连接。

AVAILABLE MODELS 可用模型 CE

型号 S541HD	uniaxial
型号 S542HD	biaxial
传感器型号	self compensated MEMS
测量范围	$\pm 2.5^\circ, \pm 5^\circ, \pm 10^\circ$
传感器分辨率	0.00056° (0.01mm/m)
精度 (MPE*)	$< \pm 0.07\% \text{ FS with } \pm 2.5^\circ$ $< \pm 0.015\% \text{ FS with } \pm 5^\circ \text{ FS}$ $< \pm 0.01\% \text{ FS with } \pm 10^\circ \text{ FS}$
传感器温度	$< \pm 0.005\% \text{ FS } / ^\circ\text{C}$
电源	12 - 24 V DC
输出信号	RS485, MODBUS RTU protocol
工作温度	-30°C to +70°C
整体尺寸	95 x 60 x 52 mm (LxWxH)
材质和防护等级	aluminium, IP67

ACCESSORIES 配件

OS540AP3D00	Fine adjustment base plate especially recommended for small ranges ($\pm 2.5^\circ$ and $\pm 5^\circ$)
OECV04V200	Flying cable for New Leonardo readout for D-Tiltmeter direct reading
OEPD023IPID	Junction box for digital sensor chains
OEPM010PIO	Measuring box for digital sensors chain

(*) MPE is the Maximum Permitted Error on the measuring range (FSR)

RAILWAY DEFORMATION SYSTEM

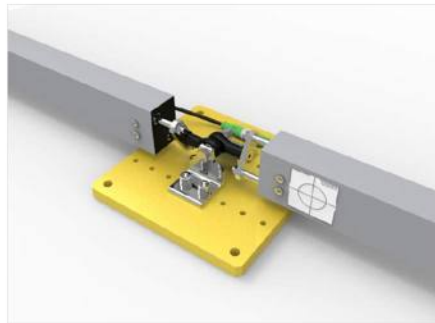
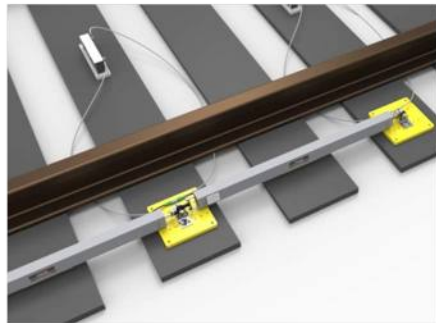
轨道变形监测系统

_HIGH SPEED RAILWAYS

_METRO RAILWAYS

_INTERFERENCES WITH
EXCAVATION NEAR RAILWAYS

Project:
Milan - Bologna
High Speed Railway
Italy



RDS SYSTEM

RDS型轨道变形监测系统

RDS 轨道变形观测系统是 SISGEO 公司开发的一种独特的监测系统，设计用于铁路轨道的纵向变形和轨枕的偏转角度的自动化监测。铁路轨道的几何形态可以通过轨道纵向水准和轨枕偏转角度几个方面来进行监测。轨道监测系统由数字式纵向电平梁传感器和数字式横向倾斜计组成。

LONGITUDINAL RDS DIGITAL GAUGES

数字式纵向电平梁

跟踪监测轨道纵向方向上两点之间的水准随时间而产生的变化，测量单位：mm。数字式RDS纵向电水平梁由内置数字式 MEMS 倾斜传感器的铝制水平梁构成，水平梁上带有光学测量标志。为了减少热效应引起的测量误差，两个水平梁之间采用的是经过特殊设计的连接装置。可设计为1、2、3m长度可选。

TRANSVERSE RDS DIGITAL GAUGES

数字式横向倾斜计

跟踪监测轨道上两根不同的轨枕在同一时间间隔上沿轨道横向方向产生的倾斜（扭转）变化，测量单位：%。数字式 RDS 横向倾斜计外观为长度 200mm 规格的铝制外壳，内置数字式 MEMS 倾斜传感器，带有不锈钢制安装支座。

ADDITIONAL INFORMATIONS 更多信息

Compared to the traditional systems, including topographic surveys, RDS offers to the Customers either high performances and significant reduction of the operating costs.

In fact when the system is correctly installed there is no field activity required by technicians at site.

RDS components, connected through digital cable to OMNIAlog with GPRS modem or 3G router, will be read automatically by WMS* (Web Monitoring System).

FieldStat* software running directly on WMS platform, allows to determine the correlations that may have influence on collected data, for example temperature, and to filter the measures from the effects of external factors. With WMS it will be possible to have alarm thresholds and alerting.

(* Trademarks of Field Srl)

OS7RDSHDLOO LONGITUDINAL GAUGE CE

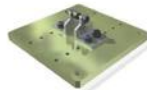
传感器型号	digital uniaxial MEMS
测量范围	±10° (±5° on request)
传感器分辨率 @ 2 Hz	0.00056° (0.01mm/m)
精度 (MPE*)	< ±0.05% FS (±0.08 mm/m with ±10° range)
传感器温度	< ±0.005% FS /°C
电源	12 - 24 V DC
输出信号	RS485, MODBUS RTU protocol
工作温度	-30°C to +70°C
棒材	60 x 40 mm
长度	1 m, 2 m, 3 m
材质	Aluminum bar and steel plate
防护等级	IP67

OS7RDSHTO2 TRANSVERSE GAUGE CE

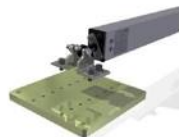
传感器型号	digital uniaxial MEMS
测量范围	±10° (±5° on request)
传感器分辨率 @ 2 Hz	0.00056° (0.01mm/m)
精度 (MPE*)	< ±0.05% FS (±0.025 mm, ±10°FS)
传感器温度	< ±0.005% FS /°C
电源	12 - 24 V DC
输出信号	RS485, MODBUS RTU protocol
工作温度	-30°C to +70°C
整体尺寸 (LxHxT)	295 x 77 x 64 mm
材质	Aluminum body and steel plate
防护等级	IP67

RDS ACCESSORIES AND SPARE PARTS 配件及

OS7RDS00LEO Terminal fixing plate, mandatory to finish the RDS longitudinal chain.



OS7RDS00LSP Spare mounting plate for longitudinal RDS beam. Required when RDS beam is removed from previous installation.



OS7RDS00LWP Mounting plate for longitudinal RDS in case of wooden sleepers.



RDS ACCESSORIES AND SPARE PARTS 配件及

OS7RDS00TSP Galvanized steel spare mounting plate for transverse RDS.



OS7RDS00TER5M Terminal junction box kit to be supplied for each RDS longitudinal chain. It is composed by a junction box with 5m electric cable.

OWE606IPD2H Signal cable to link terminal junction box to OMNIAlog.

(* MPE is the Maximum Permitted Error on the measuring range (FSR)



WMS graphs with railway twisting data and alert/alarm levels

SETTLEMENT GAUGES

沉降计

- _ BUILDINGS
- _ EMBANKMENTS
- _ FOUNDATIONS
- _ CIVIL STRUCTURES
- _ TUNNELING
- _ CONCRETE AND EARTHFILL DAMS

Project:
Boguchanskaya HPP
Russia



H-LEVEL LIQUID LEVEL SYSTEM

H-LEVEL型静力水准系统

H-LEVEL 静力水准系统由一系列 H-LEVEL 沉降计通过液体连通管连接到一个参考容器上构成，自动进行大气压力补偿，保证整个系统不受沉降计位置大气压力的变化而产生测量误差。

各个沉降传感器在量程范围内可布置在不同的高程，长期稳定性好。H-LEVEL 沉降计相互连接到同一参考容器时，静力水准系统将可以观测到同一管路上所有 H-LEVEL 沉降计的相对垂直位移。

每一个 H-LEVEL 沉降计安装点的液体压力测量值表示该沉降计与参考容器之间的高度差。

DIGITAL H-LEVEL GAUGES

0HLEV050D00	DIGITAL H-LEVEL GAUGE, 500 mm FS
0HLEV100D00	DIGITAL H-LEVEL GAUGE, 1000 mm FS
Sensor type	capacitive pressure sensor
传感器型号	500 or 1000 mm H ₂ O (2000 mm on request)
量程	0.03 mm H ₂ O with 500 mm FS
灵敏度	0.06 mm H ₂ O with 1000 mm FS
总体精度(*)	±0.15% FS with 500 mm range
(thermal effects not included)	±0.10% FS with 1000 mm range
Operating temperature	-20°C to +80°C
Non-destructive overpressure	120 kPa
Gauge dimensions (WxHxD)	118 x 140 x 70 mm



Digital H-Level gauge is composed by the yellow pressure sensor housing and the digitalizing box (D-BOX), connected with 500 mm cable.
D-BOX dimensions (WxHxD):
120 x 60 x 52 mm

(*) MPE is the Maximum Permitted Error on the measuring range (FSR)

ANALOGUE H-LEVEL GAUGES

0HLEV050000	H-LEVEL GAUGE, 500 mm FS
0HLEV100000	H-LEVEL GAUGE, 1000 mm FS
传感器类型	capacitive pressure module
量程	500 or 1000 mm H ₂ O (2000 mm on request)
灵敏度	0.03 mm with 500 mm FS
	0.06 mm with 1000 mm FS
总体精度(*)	±0.15% FS with 500 mm range
(thermal effects not included)	±0.10% FS with 1000 mm range
工作温度	-20°C to +80°C
Non-destructive overpressure	120 kPa
Gauge dimensions (WxHxD)	118 x 140 x 70 mm



MULTIPOINT SETTLEMENT SYSTEMS

多点沉降

多点沉降系统由许多液压沉降计组成，这些沉降计通过油管连接到位于较高稳定地面上的基准油罐上。沉降计是采用振弦或电容技术的压力传感器，安装在板上带有保护罩。根据要求，结算系统可以用一个仪表或用多个仪表安装。

OD422R000MA ELECTRICAL GAUGE CE

传感器型号	capacitive vented pressure transducer with built-in thermistor
量程	20 kPa, 50 kPa, 100 kPa 1.75 m, 4.4 m, 8.8 m (with Sisgeo liquid mix)
传感器灵敏度	<0.006% FS
传感器总精度 ^(*)	<±0.1% FS
输出信号	4-20 mA (pressure), Ohm (thermistor)

OD422R000VW VIBRATING WIRE GAUGE CE

传感器型号	vibrating wire non-vented pressure transducer with built-in thermistor
量程	170 kPa, 350 kPa, 700 kPa 15.0 m, 30.9 m, 61.8 m (with Sisgeo liquid mix)
传感器灵敏度	0.025% FS
传感器精度	< ±0.25% FS
输出信号	frequency (pressure), Ohm (thermistor)

The operating principle is based on the pressure variation caused by the change in height of a column of liquid. Subsequent height variations occurring between the datum point and the measuring points cause proportional variations of the hydraulic level of each settlement gauge.

COMPONENTS AND ACCESSORIES 组件和配件

OD422SERB00	SIMPLE REFERENCE VESSEL
OD422S08000	REFERENCE TANK
OMEPRO106000	BAROMETER
OTUPE060800	6 MM PE TUBE, ID/OD 6/8 MM
100DL1GL100	SISGEO LIQUID MIX
1000COPE300	HYDRAULIC CIRCUIT INSULATION
OD422SAT200	SATURATION DEVICE



PRISMS AND TARGETS

棱镜和靶标

铝合金迷你棱镜 L形支撑，精度高，尺寸小。光学靶具有多种支撑，单面或双面，以适应大量的应用。它可提供简单的螺栓和基准来完成用于结构和会聚测量的地形附件。

OGMP1040000 MINIPRISM

Max I.R. range	2000 m (7000 ft)
棱镜	24 mm
棱镜身体尺寸	Ø 60 mm, thickness 27 mm
直径	34 mm
L-support	aluminum, 12 x 15 mm section
整体尺寸	76 x 90 x 27 mm

OPTICAL TARGETS

OGCTR005000	REMOVABLE TARGET with rotary plate
OGCTR38ADPD	3/8" G PLASTIC STUD ADAPTOR for OGCTR0050000
OGCTR0050TS	TARGET 50 x 50 MM with rotary plate and M6 anchor
OGCTR0050LD	TARGET 50 x 50 MM with aluminium "L" support
OGCSH165000	SHEET OF N.16 ADHES. REFLECTOR reflector dimensions 50 x 50 mm

TOPOGRAPHIC BOLTS



0GBM025S00	Head dimensions: Ø 25 mm, height 5 mm Body diameter: Ø 10 mm Total length: 55 mm Material: stainless steel
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0GBM000S00	Head: removable, Ø 20 or Ø 40 mm Body dimension: 8 x 15 mm Total length: 177 mm Material: galvanized and stainless steel
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SETTLEMENT GAUGES

沉降计

- _ BUILDINGS
- _ EMBANKMENTS
- _ FOUNDATIONS
- _ CIVIL STRUCTURES
- _ TUNNELING
- _ CONCRETE AND EARTHFILL DAMS

Project:
Chuquicamata Mine
Chile



T-REX INCREMENTAL EXTENSOMETER T型增量伸长计

T-REX是一种可拆卸的伸缩仪，它被设计用于沿装有环形磁铁的测斜仪外壳的轴线进行增量测量。由于定位装置，T-ReX数字探头提供精确的测量。KLION分析仪软件包括一个平滑技术，允许“最佳适配”，以便评估土壤运动的真实行为。

OREX45100DS DIGITAL T-REX SYSTEM CE

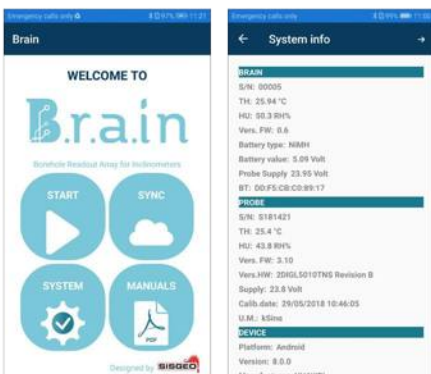
T-REX digital extensometer offers several advantages:

- wide measuring range (± 50 mm displacement per meter) which allows applications either in soil or rock
- fully compatible with Sisgeo BRAIN inclinometer system (cable, connector and BRAIN APP)
- no mechanical contact between probe and targets
- combined with inclinometer permits 3-D deformation borehole profile

测量基准	1.000 mm
测量范围	± 50 mm (100 mm)
系统重复性	0.02 mm
信号输出	RS485 - Modbus protocol
工作温度	$-30^{\circ}\text{C} + 75^{\circ}\text{C}$
Environmental	IP68 up to 1.0 MPa
尺寸	$\varnothing 40$ mm, length 1664 mm
材质	s/steel, brass and aluminium

BRAIN REEL AND APP 卷轴与应用

Measurements are performed with B.R.A.I.N bluetooth reel (product code DS2RC6000B0), available in different length from 30m up to 250m. APP available for both Android and Apple devices.



DEX IN-PLACE EXTENSOMETERS DEX型固定式沉降仪

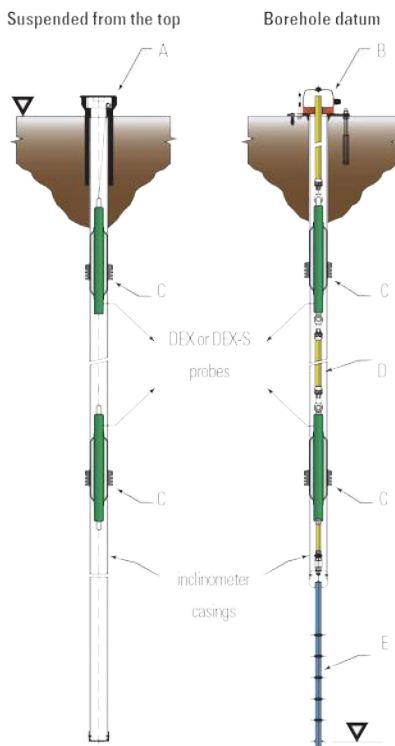
DEX 固定式沉降仪结合测斜套管应用，用于自动监测地层的沉降或者隆起位移。

多个DEX固定式沉降仪可以组成多点式沉降仪链（串），传感器之间通过不锈钢绳或杆进行连接。DEX 固定式沉降仪探头可以按需求布置在钻孔中可能产生沉降的深度位置，钻孔顶部和底部必须布置参考测量点。

TECHNICAL SPECIFICATIONS 技术规范 CE

0DEX35010000	Range 100 mm, length 1230 mm
0DEX35050000	Range 500 mm, length 1230 mm
0DEX35100000	Range 1000 mm, length 1730 mm

分辨率	0.005 mm
精度	$< \pm 0.25\%$ FS for 0DEX35010 $< \pm 0.08\%$ FS for 0DEX35050 and 0DEX35100
信号输出	0-10 V DC
工作温度	$-30^{\circ}\text{C} + 70^{\circ}\text{C}$
Environmental	IP68 (up to 1.0 MPa)
外径	35 mm



DEX-S IN-PLACE EXTENSOMETERS DEX 型固定式沉降仪

DEX-S 是在固定式沉降仪的基础上装配了双轴 MEMS倾斜传感器，用于钻孔3-D位移变形剖面监测。DEX固定式沉降计、DEX-S固定式三向位移计和PI固定式测斜仪可以组成混合链（串）来进行钻孔变形监测，是一种节约成本的解决方案。DEX-S探头连接到自动化数据采集仪上，可以在无人值守的地点实现自动化监测和预警。

TECHNICAL SPECIFICATIONS 技术规范 CE

0DEX35S102B0	Axial range 100 mm, Tilt range $\pm 10^{\circ}$
0DEX35S202B0	Axial range 100 mm, Tilt range $\pm 20^{\circ}$

SETTLEMENT SENSOR

量程	± 50 mm (100 mm)
线性度	$< \pm 0.30\%$ FS
精度	$< \pm 0.25\%$ FS
信号输出	0-10 V DC (4-20 mA on request)

TILT SENSOR

技术	self compensated MEMS
类型	Biaxial
传感器分辨率@ 2 Hz	0.00056° (0.01 mm/m)
精度	$\pm 0.07\%$ FS
传感器温度	$< \pm 0.005\%$ FS

THERMISTOR

传感器类型	NTC thermistor
测量范围	$-50^{\circ}\text{C} + 80^{\circ}\text{C}$
分辨率	0.1 $^{\circ}\text{C}$
精度	$\pm 0.5^{\circ}\text{C}$

DEX AND DEX-S ACCESSORIES

0WE104SG0ZH	DEX signal cable, 4 wire
0WE110DX0ZH	DEX-S signal cable, 10 wire
0S4TS101000 (A)	Support head, suspended installation
0WRAC200000	Stainless steel support wire, 2 mm
0S4IPIT00L0	Wire clamping tool
0DEX0TT6000 (E)	Borehole bottom anchor
0S4R0DOAC00 (D)	Stainless steel placement rods
0DEX0TS2350 (B)	Support head, rod installation
0REXORING93 (C)	DEX ring magnet, ID 71 mm OD 95 mm
0REXORING83 (C)	DEX ring magnet, ID 60 mm OD 83 mm

SETTLEMENT GAUGES

沉降计

- _ BUILDINGS
- _ EMBANKMENTS
- _ FOUNDATIONS
- _ CIVIL STRUCTURES
- _ TUNNELING
- _ CONCRETE AND EARTHFILL DAMS

Project:
Atshar Dam
Turkey



MAGNET EXTENSOMETER (BRS)

磁铁伸长计

磁力伸长仪是用于测量土壤和路堤中不同深度的沉降或隆起的系统。系统由一个具有外部波纹管和环形磁铁的接入管组成。读数是在接入管中降低配备有簧片开关探头的便携式读数器。

COMPONENTS

OD111P30000	3 M SECTION ACCESS TUBE
OD111P15000	1.5 M SECTION ACCESS TUBE
OD111PV5500	CORRUGATED PIPE, OD 55 MM
OD111TF6000	TELESCOPIC END AND DATUM
OD111TS1000	SUSPENSION HEAD
OD111AF6000	SPRING MAGNET RING ID 60 mm, max span 300 mm
OD111AR6000	MAGNET SETTLEMENT PLATE id 60 mm, plate OD 300 mm

C121 PORTABLE READOUT

OC121005000	READOUT, 50 M FLAT CABLE
OC121010000	READOUT, 100 M FLAT CABLE
OC121015000	READOUT, 150 M FLAT CABLE
OC121KITR00	DIPPING PROBE SPARE KIT
探头尺寸	OD 16 mm, length 250 mm
电缆部类	millimetre, class II ECC
电缆护套	nylon
系统精度	±1 mm
工作温度	-40°C +80°C

HORIZONTAL DISPLACEMENT MAGNET SYSTEM

Magnet system can be installed horizontally to measure horizontal ground movements.

OTUHDP5000	HDPE ACCESS TUBE, OD 50 MM
OD111PV7000	CORRUGATED PIPE, OD 70 MM
OD1RINV4000	DEAD END PULLEY ASSEMBLY
OD111AH6500	MAGNET RING ID 70 MM



PROFILE GAUGE (PROFILER)

Profiler型剖面沉降仪

Profiler 是一种液体压力式剖面沉降观测系统，设计用来监测填方工程或者基础底部的沉降和隆起变化。Profiler 剖面沉降仪的探头内置在一条埋设在土体内部的HDPE管中，通过牵引线缆在管中拉动进行测量。

传感器测量到的剖面轮廓是HDPE管路相对于设置在稳定的地层表面之上的参考容器之间的高差。

OD5HPG33100 PROFILER PROBE 探头

量程	8.5 m
分辨率	1 mm
总体精度	±20 mm
时间延迟	3-10 sec
直径	34 mm
长度	280 mm
材质	stainless steel

READOUT AND REEL

数字显示	4.5 digits LCD
A/D 转换器	14 bits + sign
线性阅读	±1 digit
Zero off-set	external adjustable
电源	12V DC rechargeable battery
工作时间	> 15 hours
工作温度	-10°C +50°C
拨禾轮直径	695 mm
卷筒电缆容量	< 150 meter
总重量	25 Kg with 50 m cable

OWE206M1200 PROFILER CABLE

Profiler cable includes electrical cable and liquid tube encapsulated in a polyurethane external jacket.

最大长度	150 m
液压管	nylon 8 x 6 mm
液压流体	de-aired water-glycerine mix
记号	every meter
电缆布局	6 x 0.22 mm
外套	polyurethane LSZH, OD 13.7 mm



FIXED EXTENSOMETERS

固定式伸长计

固定式伸长计通常被定义为置于路堤填筑物内或钻孔内，用于监测两点之间的沉降或隆起的装置。提升管杆顶部的光学测量提供精确的监测。电传感器可用于远程不可访问位置的自动读数。

SETTLEMENT PLATFORM

The primary advantage of the settlement platform is its simplicity. The settlement platform consists of a galvanized square plate to which a riser settlement rod is attached. An anti-friction corrugate pipe is placed around the riser rod. Optical levelling measurements, on the survey point mounted on the top cap, provide records of plate elevation.

OD100A20000	2 M SECTION RISER ROD
OD111PV5500	CORRUGATE PIPE, OD 55 mm
OD100B05000	SQUARE PLATE 500 x 500 mm
OD100T15000	TOP CAP AND SURVEY POINT

TELL-TALE EXTENSOMETER

The tell-tale extensometer is a single-point extensometer which is typically used for precise monitoring of ground surface settlement or heave. It consists of a stainless steel bottom anchor to which a string of riser measuring rods is attached. An anti-friction corrugate pipe is placed around the riser rods. Optical levelling measurements of the top head of the riser rod provide a measure of ground settlement. Sliding rings are placed at both ends in order to prevent down drag forces on the rod.

OD100A20000	2 M SECTION RISER ROD
OD111PV5500	CORRUGATE PIPE, OD 55 mm
OD100TT6000	BOTTOM ANCHOR
OD100TT0100	TOP CAP AND SURVEY POINT
OD100TTEL10	DTM MEASURING HEAD

ODTM000000 DTM ELECTRICAL TRANSDUCERS

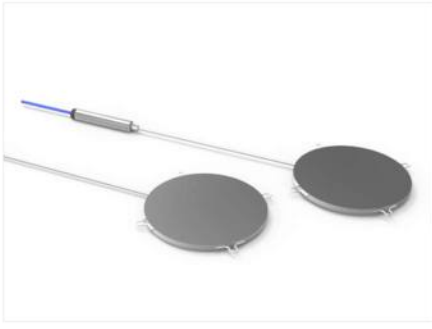
DTM electrical transducers can be mounted on either settlement platforms or the tell-tale extensometers.

范围	250 mm, 500 mm, 1000 mm
传感器精度	±0.25% FS
输出信号	4-20 mA current loop

PRESSURE & LOAD CELLS

应荷载监测仪器

- _ EMBANKMENTS
- _ TUNNELING
- _ CONCRETE MASS
- _ EARTH FILL DAMS
- _ PILES
- _ DIAPHRAGM WALLS
- _ DEEP EXCAVATIONS
- _ BRIDGES AND VIADUCTS



EARTH PRESSURE CELLS

土压力计

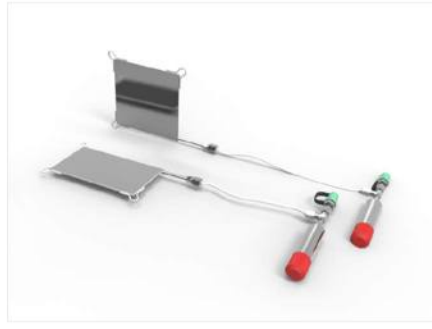
L140系列土压力计设计用来监测土石坝和填方工程（路、堤等）内部的总压力（包含孔隙水压力），或者是岩土体作用在结构和挡土墙之上的界面接触总压力。作用在承压盘上的应力（总压力）通过压力传感器转换成电信号，而且可以通过各种便携式读数仪进行数据采集或者通过自动化数据采集系统实现远程数据采集与传输。

AVAILABLE MODELS 可用模型 CE

型号 L143D	vibrating wire technology
量程	350, 500, 700 kPa 1, 1.7, 2, 5, 7, 10 MPa
灵敏度	0.03% FS
总体精度 (MPE*)	< ±0.25% FS
信号输出	frequency (VW), resistance (T)
压力盘尺寸	diameter 230 mm thickness 12 mm
传感器尺寸	OD 28 mm, 180 mm long
材质	Stainless steel
工作温度	-20°C +80°C
体重	0.6 kg

型号 L141D	piezo resistive technology
量程	200, 500 kPa 1, 2, 5, 10 MPa
灵敏度	0.002% FS
总体精度 (MPE*)	< ±0.25% FS
信号输出	4-20 mA current loop
压力盘尺寸	diameter 230 mm thickness 13 mm
传感器尺寸	OD 28 mm, 180 mm long
材质	Stainless steel
工作温度	-20°C +80°C
重量	0.6 kg

(* MPE is the Maximum Permitted Error on the measuring range (FSR))



NATM STRESS CELLS

NATM 应力计

SISGEO柔性隔膜NATM应力单元除了优化喷射混凝土，还有混凝土隧道衬砌中的径向和切向应力的测量。读数是由C600 2MV便携式读出器直接连接到应力单元终端所读取的。

AVAILABLE MODELS 可用模型 CE

型号 L112R	radial stress cell
量程	0-5 MPa (50 Bar)
灵敏度	< ±0.3% FS
压力盘的大小	square 150 x 150 mm
压力盘的厚度	5 mm
换能器尺寸	OD 25 mm, 130 mm long
型号 L112T	tangential stress cell
测量范围	0-20 MPa (200 Bar)
精度	< ±0.3% FS
压力盘的大小	rectangular 100 x 200 mm
压力盘的厚度	5 mm
传感器	size OD 25 mm, 130 mm long

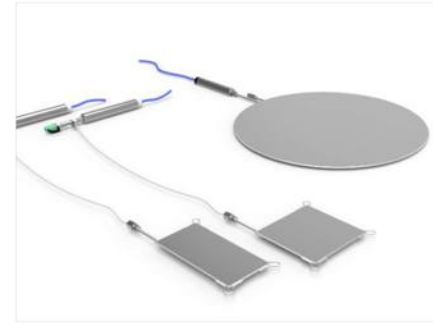
OC6002MV000 DIGITAL INDICATOR CE

数字显示	3.5 LCD
分辨率	10 kPa (0.01 MPa)
Environmental	-5°C +50°C, dust-proof case



OL111PUMPOO REPRESSURIZING DEVICE

This device permits to increase the volume of the hydraulic oil inside the cavity of the pressure pad, expanding it, in order to maintain a close contact between the pad and the surrounding material after the concrete has cured.



HYDRAULIC PRESSURE CELLS

液压力式压力盒

在工程建设期间，地表或者填方土体的沉降量观测对于工程结构的稳定性监测来说是非常重要的工作。根据不同的应用类型，土体沉降计可以按不同的配置方式进行安装应用——通过一根液体连通管将所有沉降计连接到同一个沉降参考点上，并接入到同一个自动化数据采集系统中。

AVAILABLE PRESSURE PADS

OL11151500	for radial stress in concrete
压力盘尺寸	150 x 150 mm
最大工作压力	up to 5 MPa
OL111102000	for tangential stress in concrete
压力盘尺寸	100 x 200 mm
最大工作压力	100 x 200 mm
OL111204000	for contact soil/rock-structure
压力盘尺寸	200 x 400 mm
最大工作压力	up to 5 MPa
OL111D05000	for contact soil-concrete
压力盘尺寸	circular 500 mm OD
最大工作压力	up to 1 MPa

AVAILABLE TRANSDUCERS CE

型号 PK45H	VW pressure transducers
量程	350, 500, 700 kPa, 1, 1.7, 2, 5, 7, 10, 20 MPa
灵敏度	0.03% FS
总体精度 (MPE*)	< ±0.25% FS
信号输出	frequency (VW), resistance (T)
工作温度	-20°C +80°C
传感器尺寸	OD 27 mm, 180 mm long
型号 P252A	electrical pressure transducers
量程	200, 500 kPa, 1, 2, 5, 10, 20 MPa
灵敏度	0.002% FS
总体精度 (MPE*)	< ±0.20% FS
信号输出	4-20 mA current loop
工作温度	-20°C +80°C
传感器尺寸	OD 27 mm, 180 mm long

PRESSURE & LOAD CELLS

应荷载监测仪器

- _ EMBANKMENTS
- _ TUNNELING
- _ CONCRETE MASS
- _ EARTH FILL DAMS
- _ PILES
- _ DIAPHRAGM WALLS
- _ DEEP EXCAVATIONS
- _ BRIDGES AND VIADUCTS



HYDRAULIC ANCHOR LOAD CELLS

液压式锚索计

液压式锚索测力计设计用来监测土钉、锚杆和锚索上的荷载（力）。承压盘内在真空状态下填充了脱气油，荷载（力）直接通过包尔登管式压力表进行测量，单位为KN。需要远程采集与传输时，也可以使用电测式压力传感器对测量结果进行信号转换。

GAUGE MANOMETER MODEL

0L2M04030H0	300 KN, ID 40 MM, OD 140 MM
0L2M07050H0	500 KN, ID 71 MM, OD 163 MM
0L2M09075H0	750 KN, ID 92 MM, OD 196 MM
0L2M11100H0	1000 KN, ID 110 MM, OD 231MM
0L2M13100H0	1000 KN, ID 138 MM, OD 244 MM
0L2M16150H0	1500 KN, ID 165 MM, OD 293 MM
0L2M22250H0	2500 KN, ID 225 MM, OD 380 MM
超量程	120% with less than 2% FS zeroshift
精度	class $\pm 1.5\%$ FS
材质	AISI 304 stainless steel
工作温度	-35°C +60°C

ELECTRICAL MODEL 电模型

0L2E0705000	500 KN, ID 71 MM, OD 163 MM
0L2E0907500	750 KN, ID 92 MM, OD 196 MM
0L2E1110000	1000 KN, ID 110 MM, OD 231 MM
0L2E1310000	1000 KN, ID 138 MM, OD 244 MM
0L2E1615000	1500 KN, ID 165 MM, OD 293 MM
超量程	120% with less than 2% FS zero shift
精度	$\pm 1\%$ FS
信号输出	4-20 mA current loop
温度漂移	0.05 % FS / °C
材质	AISI 304 stainless steel
工作温度	-35°C + 60°C



0L2E Electro-hydraulic anchor load cell



ELECTRIC ANCHOR LOAD CELLS

电阻应变式锚索测力计

电阻应变式锚索测力计主体为一个环形不锈钢圆柱体，内部安装了8-16只全桥结构的电阻应变计。锚索测力计设计时充分考虑了偏心荷载的影响，使其灵敏度达到最小化。为了确保施加在传感器表面的荷载（力）能够平均分布到每一只应变计上，高强度的荷载分布板是必须配置的。

AVAILABLE MODELS 可用模型

CE

0L204V0300T	300 KN, ID 40 MM, OD 155 MM
0L204V0500T	500 KN, ID 40 MM, OD 155 MM
0L205V0500T	500 KN, ID 50 MM, OD 155 MM
0L207V0500T	500 KN, ID 71 MM, OD 155 MM
0L207V0750T	750 KN, ID 71 MM, OD 155 MM
0L211V0750T	750 KN, ID 110 MM, OD 200 MM
0L212V1000T	1000 KN, ID 120 MM, OD 220 MM
0L216V1200T	1200 KN, ID 165 MM, OD 260 MM
0L216V1500T	1500 KN, ID 165 MM, OD 260 MM
0L219V1800T	1800 KN, ID 190 MM, OD 300 MM
0L222V2500T	2500 KN, ID 225 MM, OD 340 MM

超量程	150%
灵敏度	0.06% FS
精度	$< \pm 0.5\%$ FS
零点漂移	$< 0.005\%$ FS / °C
信号输出	1.5mV/V at FS or 2 mV/V at FS
电源	from 2V DC to 10V DC
工作温度	-30°C +70°C
计算机温度范围	-30°C +70°C
材质	stainless steel 17-4 PH

DISTRIBUTION PLATES

0L20040PD00	centre hole 40 mm, OD 110 mm
0L20050PD00	centre hole 50 mm, OD 110 mm
0L20071PD00	centre hole 71 mm, OD 110 mm
0L20110PD00	centre hole 110 mm, OD 155 mm
0L20120PD00	centre hole 120 mm, OD 180 mm
0L20165PD00	centre hole 165 mm, OD 210 mm
0L20190PD00	centre hole 190 mm, OD 250 mm
0L20225PD00	centre hole 231 mm, OD 290 mm

ACCESSORIES 配件

0ECON07MV00	MIL male connector with cap
0ELC420MA00	4-20 mA transmitter (2 wires)



ELECTRIC LOAD CELLS

实心荷重计

实心荷重计专为桩基测试设计，它的主体是一个热处理钢材质的圆柱体，内部安装了4只应变计。经实验测试表明，L2CT实心荷重计在重负载的应用条件下拥有良好的长期稳定性。

L2CE ELECTRO-HYDAULIC LC

CE

0L2CE019000	1900 KN, OD 209 MM
0L2CE030000	3000 KN, OD 264.5 MM
精度 (*)	$< \pm 1\%$ FS
信号输出	4-20 mA current loop
工作温度	from -20° to +80°C
防护等级	IP 68 up to 100 KPa
材质	stainless steel
电源	from 9 to 30 V DC
Overall size (ODxLxH)	209 x 365 x 36.5 mm 0L2CE019 264.5 x 421 x 36.5 mm 0L2CE030

(*) linearity, hysteresis and repeatability

L2CT-L2CX SOLID LOAD CELLS

CE

Specially designed for pile testing, L2CT model have higher accuracy but a large encumbrance; L2CX model have a good accuracy and smaller dimensions.

型号	L2CT
量程	5000 KN, 8000 KN, 10000 KN
精度	200 mm, 250 mm, 300 mm
高度	$< \pm 0.1\%$ FS
信号输出	2 mV/V at FS
工作温度	-20°C +70°C
防护等级	IP 65
型号	L2CX
精度	3000 KN, 4000 KN, 5000 KN
高度	110 mm (for all full scales)
精度	$< \pm 0.5\%$ FS
信号输出	2 mV/V at FS
工作温度	-20°C +70°C
防护等级	IP 67

EXTENSOMETERS & JOINTMETERS

裂缝/位移监测仪器

_ TUNNELING

_ DAMS

_ HISTORICAL BUILDINGS

_ EMBANKMENTS

_ DEEP EXCAVATIONS

_ LANDSLIDES

_ BRIDGES AND VIADUCTS



DIGITAL TAPE EXTENSOMETER

DN 型数字式卷尺收敛计

卷尺收敛计设计用来精确测量两个永久安装的测量参考点之间的位移变化，参考点可以选用挂钩式或螺纹式（3/8 吋）的螺栓。典型应用包括隧道衬砌，根据新奥法（NATM）施工的竖井、地下洞室以及天然洞穴的收敛监测。

AVAILABLE MODELS

0DN0030D000	30 M TAPE, HOOK TERMINALS
0DN0030D380	30 M TAPE, THREAD TERMINALS

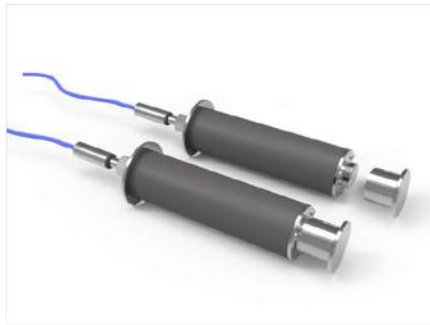
Gauge resolution	0.01 mm
Gauge repeatability	0.1 mm

精度	±0.01 mm
工作温度	-10°C +60°C
Tape tension	11 kg
Tape material	stainless steel
Tension indicator	optical
上电和关电	automatic
重量	1.6 kg

REFERENCE BOLTS

A wide range of measuring bolts are available: to be grouted, welded or anchored to the structure.

0DNOCH20000	200 mm groutable 3/8" stud bolt
0DNOCH50000	500 mm groutable 3/8" stud bolt
0DNOCH1000	1000 mm groutable 3/8" stud bolt
0DNOCH05000	50 mm weldable 3/8" stud bolt



EMBEDMENT JOINTMETERS

埋入式测缝计

埋入式测缝计设计用来预埋在混凝土大坝内部，横跨大坝接缝两侧，监测两个不同坝段之间的相对位移变化。埋入式测缝计采用特殊的设计，允许在模板上将其直接安装。内部的振弦式位移传感器应该在中间设置量程，允许其向两个方向自由运动。

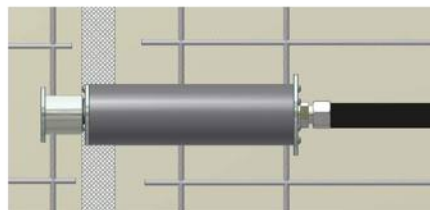
AVAILABLE MODELS

CE

0D314C025VW	VW EMBEDMENT JOINTMETER, 25 MM RANGE
0D314C050VW	VW EMBEDMENT JOINTMETER, 50 MM RANGE
0D314C100VW	VW EMBEDMENT JOINTMETER, 100 MM RANGE
0D314C150VW	VW EMBEDMENT JOINTMETER, 150 MM RANGE

TECHNICAL CHARACTERISTICS

传感器类型	vibrating wire transducer
量程	25, 50, 100, 150 mm
分辨率	<0.025% FS
精度	< ±0.5% FS
信号输出	frequency (VW), resistance (T)
工作温度	-20°C +80°C
材质	stainless steel



Embedment jointmeter installation scheme



EMBANKMENT EXTENSOMETERS

土体位移计

土体位移计设计用来测量大型填方工程内部的土体应变（位移）变化。土体位移（应变）观测系统由一系列振弦式位移传感器、延长杆和锚固板构成。将这些位移传感器接入到数据采集系统中，可以实现实时的自动化监测与预警。

SYSTEM COMPONENTS

0D2320BM100	EXTENSION ROD, 1 M
0D2320BM200	EXTENSION ROD, 2 M
0D2320BM300	EXTENSION ROD, 3 M
0D111PV5500	PVC CORRUGATE
	ANTIFRICTION SLEEVE
0D232AN5000	ANCHOR PLATE, DIAM 500 MM
0D232AN5500	ANCHOR PLATE, 500 x 500 MM

MEASURING ELEMENTS

CE

0D232T050VW	50 mm (+25 mm) range
0D232T100VW	100 mm (+50 mm) range
0D232T150VW	150 mm (+75 mm) range
传感器类型	vibrating wire transducer
量程	50, 100, 150 mm
分辨率	<0.025% FS
精度 (MPE*)	< ±0.30% FS
信号输出	frequency (VW), resistance (T)
典型频率范围	2250 - 3000 Hz
工作温度	-20°C +80°C
材质	stainless steel
防护等级	IP68 up to 1.0 MPa
信号电缆	OWE104X20ZH

(* MPE is the Maximum Permitted Error on the measuring range (FSR))

EXTENSOMETERS & JOINTMETERS

裂缝/位移监测仪器

_ TUNNELING

_ DAMS

_ HISTORICAL BUILDINGS

_ EMBANKMENTS

_ DEEP EXCAVATIONS

_ LANDSLIDES

_ BRIDGES AND VIADUCTS



MULTIPOINT ROD EXTENSOMETERS (MPBX)

MPBX 型多电位移计

多点位移计 (MPBX) 设计用来埋设在钻孔中监测岩土体不同深度位置的位移变化, 通过不同长度的测量杆 (可选材质) 来进行深度定位。安装前将预设好长度的测量杆套入尼龙保护管 (保持测量杆的自由度) 中, 其末端固定到灌浆锚头上。可以通过线性位移传感器 (DTE) 或游标卡尺进行位移变化测量。

AVAILABLE MODELS 可用模型

0D222AC00A0	s/steel or invar rods, DTE ≤ 100 mm
0D222AC00B0	s/steel or invar rods, DTE > 100 mm
0D222FG00A0	fibreglass rods, DTE ≤ 100 mm
0D222FG00B0	fibreglass rods, DTE > 100 mm
Number of bases	1 (single), from 2 to 7 (multiple)
Multiple head top tube	OD 120 mm
Extensometer rods	fibreglass pre-assembled
	stainless steel, 2 m sections
Protective sleeve	nylon 11 (nilsan), OD 12 mm

GROUTABLE ANCHORS

Groutable anchors are supplied with all MPBX where packer anchors are not requested.

材质	galvanized steel rebar
直径/长度	Ø 16 mm / 400 mm (MPBX with fibreglass rods) Ø 22 mm / 400 mm (MPBX with stainless steel rods)

PACKER ANCHORS

Two models of packer anchors are available, following different drilling diameter: 101 mm (4") and 127 mm (5").

If packer anchors are needed, the following products codes shall be added:

0D222PKR127	PACKER ANCHOR for Ø 127 mm drillings (one for each measuring base)
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DISPLACEMENT TRANSDUCERS FOR MPBX

MPBX位移传感器

MPBX测量可以用深度千分尺手动进行, 或者通过振动导线或4-20mA位移传感器和读出或数据记录器远程进行。振动线和4-20mA换能器都防水, 最高可达1.0MPa, 输出信号适合长距离传输。

VIBRATING WIRE TRANSDUCERS €€

0DTE000VW00	VIBRATING WIRE DTE
范围	10, 25, 50, 100, 150, 200 mm
信号输出	frequency (VW), resistance (T)
精度 (MPE*)	< ±0.50 % FS for 10 and 25 mm range; < ±0.30 % FS for 50 mm, 100, 150 and 200 mm range
典型频率范围	2250 - 3000 Hz
工作温度	- 20°C +80°C
防护等级	IP68 up to 1.0 MPa

POTENTIOMETRIC TRANSDUCERS €€

0DTE1A00000	LINEAR POTENTIOMETER DTE
范围	25, 50, 100, 150, 200 mm
信号输出	4-20 mA current loop
精度 (MPE*)	< ±0.30 % FS for 25 mm range < ±0.20 % FS for 50 and 100 mm range < ±0.15 % FS for 150 and 200 mm range
工作温度	- 20°C +80°C
防护等级	IP68 up to 1.0 MPa

0DIGD020000 DIGITAL GAUGE

The digital gauge kit consists of a depth caliper with LCD (readings in metric and imperial units), a set of extension rods and carrying case.

范围	from 0 to 200 mm
分辨率	0.01 mm
温度速率	0° C - 40° C
湿度等级	≤ 80%



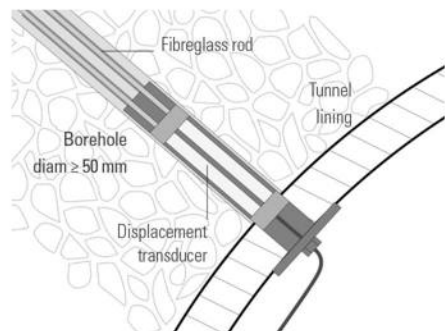
MEXID EXTENSOMETERS

MEXID型多点位移计

MEXID 是小型化的多点位移计, 可以安装到直径 50mm 的钻孔中。位移传感器被集成在测头中, 将测头定位到设计深度并且灌浆固定之后, 只有电缆接头露在钻孔外。专用的灌浆管可以用于锚头在土体或岩体中进行灌浆固定。

AVAILABLE MODELS 可用模型 €€

0D2MX00A000	fibreglass rods, 4-20mA output available with 50 and 150 mm range
0D2MX00W000	fibreglass rods, vibrating wire sensors available with 50 and 150 mm range
测点数	from 2 to 4
信号输出	4-20 mA current loop frequency (VW), resistance (T)
精度	< +0.20% FS (4-20mA output) < +0.30% FS (Vibrating wire)
头部直径	48.3 mm
头长	476 mm for 50 mm range 816 mm for 150 mm range
Extensometer rods	fibreglass, OD 7 mm
Protective sleeve	nylon 11 (nilsan), OD 12 mm
Groutable anchor	rebar 16 mm OD, 400 mm long
防护等级	IP68 (watertight up to 1.0 MPa)



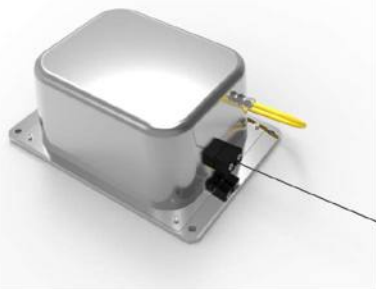
RODS AND CABLE 杆和电缆

0D2218MFG00	FIBREGLASS ROD, 7 MM OD with antifriction protective sleeve
0WE1160LSZH	LSZH MULTICORE CABLE, 8 PAIRS 8 x 2 (24 AWG) conductors

EXTENSOMETERS & JOINTMETERS

裂缝/位移监测仪器

- _ TUNNELING
- _ DAMS
- _ HISTORICAL BUILDINGS
- _ EMBANKMENTS
- _ DEEP EXCAVATIONS
- _ LANDSLIDES
- _ BRIDGES AND VIADUCTS



WIRE CRACKMETER AND DEFORMETER

电线探伤仪和变形计

电线探伤仪被设计成监测位于最多30米距离处的两个锚点之间的距离变化。变形计用来监测两个相对表面之间的位移（隧道、岩体中的收敛等）。USB变形计结合一个小型自动监测记录器。

0D241A20000 WIRE CRACKMETER 电线探伤仪

机械范围	2000 mm
电气范围	240 mm
	±1 mm (depends mainly from the thermal effects on the wire)
信号输出	4-20 mA current loop
工作温度	-20°C +80°C
线直径	2 mm, stainless steel
最大钢丝	8 Kg
Transducer housing	300 x 200 x 185 mm
Target assembly	eyebolt expansion anchor
target assembly	eyebolt expansion anchor

0D313F00000 WIRE DEFORMETERS 电线探伤仪

传感器型号	linear potentiometer or vibrating wire
工作温度	4-20 mA current loop
	frequency (VW), resistance (T)
测量范围	25 mm (±12.5), 50 mm (±25)
精度	< ±0.3% FS (4-20mA)
	< ±0.5% FS (vibrating wire)
工作温度	-20°C +80°C
体直径	16 mm
电线	stainless steel, up to 10 meter
防护等级	IP68 (watertight up to 1.0 MPa)

0D314FV8000 USB DEFORMETER

传感器型号	rotating potentiometer
位移范围	80 mm
分辨率	0.003 mm
精度	< ±0.1% FS
工作温度	-10°C +60°C
A/D转换器	15 bits
仓储容量	>51.000 measurements
电池续航	4 years with 1 saving per hour
防护等级	IP65



ELECTRICAL AND VW CRACKMETERS

电振动和探伤仪

电振动和探伤仪用于监测混凝土结构或岩石中表面裂纹和节理的移动。容纳在传感器主体中的位移传感器位于接头/裂纹上，这样使得锚定之间距离的测量变化。

ELECTRICAL CRACKMETERS

技术	Linear potentiometer
全刻度 (*)	10, 25, 50, 100, 150 mm
精度 (MPE**)	< ±0.3% FS
信号输出	4-20 mA current loop
电源	12-24V DC
工作温度	-20°C +60°C
传感器直径	16 mm
材质	stainless steel
防护等级	IP68 (watertight up to 100 kPa)

(* Available up to 260 mm upon request

(**) MPE is the Maximum Permitted Error on the measuring range (FSR)

VIBRATING WIRE CRACKMETERS

技术	Vibrating wire
全刻度 (*)	10, 25, 50, 100, 150 mm
精度 (MPE**)	< ±0.5% FS
信号输出	frequency (VW), resistance (T)
工作温度	-20°C +80°C
体直径	16 mm
材质	stainless steel
防护等级	IP68 (watertight up to 1.0 MPa)

(* Available up to 300 mm upon request

(**) MPE is the Maximum Permitted Error on the measuring range (FSR)

ACCESSORIES 配件

0D31Y1DTE00	Y-AXIS STAINLESS STEEL FIXING KIT
0D31Z1DTE00	Z-AXIS STAINLESS STEEL FIXING KIT



MECHANICAL CRACKMETERS

机械探伤仪

裂纹仪和接合仪用于监测混凝土结构或岩石中表面裂纹和节理的移动。

锚之间的移动通过机械式刻度盘测量仪获得的。TT-1型是价格低廉和简单裂缝监测仪结构安装在裂缝两侧，可对裂缝进行双向监测。

AVAILABLE MODELS

0D3101D3000	UNIAXIAL CRACKMETER
0D3103D3000	3-D CRACKMETER ASSEMBLY
机械范围	0-30 mm
基本长度	500 mm (uniaxial)
	200 mm (3-D)
1-D anchors	2 shell expanding anchors
	Ø 14 mm, length 55 mm
3-D anchors	2 groutable rebar
	Ø 16 mm, length 80 mm
Material	Stainless steel and aluminium

0DIG30KIT00 DIAL GAUGE KIT

相容	0D3101D3000
	0D3103D3000
测量范围	0-30 mm
测量分辨率	0.01 mm
测量精度	±0.05 mm

0D300LINE00 TT-1 CRACK MONITOR

型号	2-D biaxial
机械范围	±20 mm (X-axis)
	±10 mm (Y-axis)
分辨率	1 mm
材质	polycarbonate

STRAIN-GAUGES & THERMOMETERS

应变/温度观测仪器

_ PILES AND MASS CONCRETE

_ CONCRETE STRUCTURES,
BEAMS AND COLUMNS

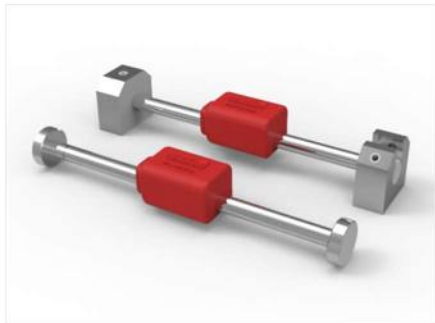
_ CONCRETE FOUNDATIONS
AND DIAPHRAGM WALLS

_ TUNNEL SEGMENTS

_ STEEL STRUCTURES, PIPES
AND ARCH SUPPORTS

_ GRAVITY AND ARCH DAMS

_ BRIDGES AND VIADUCTS



VIBRATING WIRE STRAIN-GAUGES

振弦式应变计

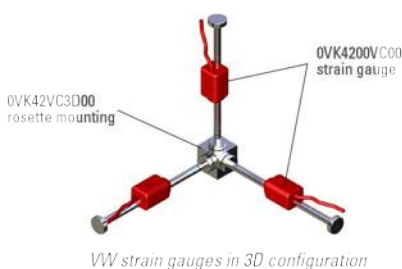
振弦式应变计设计用来监测应变变化，并通过应变评价钢结构或者混凝土结构上的应力状态。内置的热敏电阻温度传感器可以提供测量点的温度，用来进行温度补偿。可以提供无应力计筒和三向应变计安装支架。

AVAILABLE MODELS 可用模型

0VK4000VS00	ARC-WELDABLE GAUGE
0VK4200VC00	EMBEDMENT GAUGE
0VK4000SM00	EMBED. SHOTCRETE GAUGE
Excitation method	pluck or sweep
量程	3000 $\mu\epsilon$ (shotcrete 10000 $\mu\epsilon$)
信号输出	frequency (VW), resistance
灵敏度	(T)
精度	1.0 $\mu\epsilon$
稳定性	$\pm 0.5\%$ FS
典型频率	$\pm 0.5\%$ FS / year
线圈电阻	400-1200 Hz
温度传感器	150 ohm
工作温度	NTC thermistor -20°C + 80°C

ACCESSORIES

0VK42VC3D00	3D rosette mounting block for embedment strain gauges.
0VK400JIG00	Spacing jig for mounting the arc-weldable strain gauges end blocks.
0VK400MB200	Pair of arc-weldable surface mounting blocks.
0VK400COVER	S/steel protective cover with lugs and pair of weldable blocks



VW strain gauges in 3D configuration



VIBRATING WIRE REBARS

振弦式钢筋应力计

振弦式钢筋应变计就是在一根中空的高强度螺纹钢筋内部置入了一支振弦式应变传感器，每支应变传感器都带有激励线圈和热敏电阻温度传感器。可以提供不同尺寸规格的振弦式钢筋应变计，用来适配钢筋混凝土中加强钢筋的尺寸。

AVAILABLE MODELS 可用模型

0VKBAR01800	VW REBAR 18 MM
0VKBAR02200	VW REBAR 22 MM
0VKBAR02600	VW REBAR 26 MM
0VKBAR03000	VW REBAR 30 MM
有源量规长度	47.5 mm
量程	$\pm 1500 \mu\epsilon$
信号输出	frequency (VW), resistance
灵敏度	(T)
精度	1.0 $\mu\epsilon$
稳定性	$\pm 0.5\%$ FS
典型频率	0.1% FS / year
线圈电阻	from 800 to 2500 Hz
温度传感器	150 Ohm
Thermal coeff. of expansion	NTC thermistor
工作温度	5 ppm / °C



SPOT WELDABLE STRAIN GAUGES

振弦式点焊式应变计

振弦式点焊式应变计主要设计用来测量钢结构表面的应变变化，它由一支点焊式应变计和一个带有激励线圈的保护罩组成。应变计在出厂时设置为中间量程。振弦式点焊式应变计的安装最好使用厂家推荐的电焊机。

0VK4100VS00 SPOT WELDABLE SG

有源量规长度	47.5 mm
量程	$\pm 1500 \mu\epsilon$
信号输出	frequency (VW), resistance
灵敏度	(T)
精度	1.0 $\mu\epsilon$
稳定性	$\pm 0.5\%$ FS
典型频率	0.1% FS/year
线圈电阻	from 600 to 2500 Hz
温度传感器	150 Ohm
Thermal coeff. of expansion	NTC thermistor
工作温度	5 ppm / °C -20°C a +80°C

0VK4100VSP0 PLUCKING COIL



0VK4100VSG0 STRAIN GAUGE ONLY



ACCESSORIES AND COMPONENTS 配件及备件

0VK410PSW00	Portable spot-welder for VW spot-weldable strain gauges
0WE104SG0ZH	LSZH signal cable
0VK4100VSG0	Strain-gauge only
0VK4100VSP0	Plucking coil only

STRAIN GAUGES & THERMOMETERS

应变/温度观测仪器

_ PILES AND MASS CONCRETE

_ CONCRETE STRUCTURES,
BEAMS AND COLUMNS

_ CONCRETE FOUNDATIONS
AND DIAPHRAGM WALLS

_ TUNNEL SEGMENTS

_ STEEL STRUCTURES, PIPES
AND ARCH SUPPORTS

_ GRAVITY AND ARCH DAMS

_ BRIDGES AND VIADUCTS



RESISTIVE STRAIN GAUGES

电阻应变式应变计

电阻应变式应变计的敏感元件是一组粘合在钢条上的全桥结构的电阻应变片。全桥结构可以补偿温度和挠曲对测量结果的影响。当需要进行连续的动态应变测量时，可以用电阻应变式应变计来替代振弦式应变计。

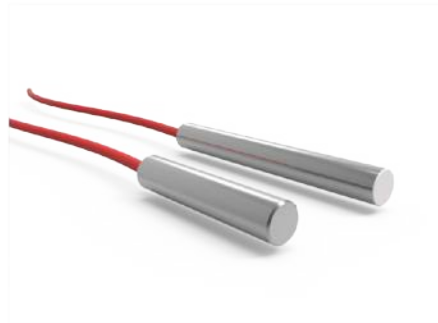
AVAILABLE MODELS 可用模型 CE

0L3400VS000	STRAIN-GAUGE BAR, mV/V output
0L3400VSC00	STRAIN-GAUGE BAR, V output
0L3400AS000	STRAIN-GAUGE BAR, 4-20 mA output
条形截面/长度	8 x 8 mm / 400 mm
量程	±1500 µε (nominal)
灵敏度	0.0015 mV/µε
总体精度	< ±1% FS
信号输出	±2 mV/V at FS (0L3400VS000) ±10 mV at FS (0L3400VSC00) 4-20 mA current loop (0L3400AS000)
工作温度	-20°C +70°C



CABLES AND ACCESSORIES 电缆及配件

0WE1060LSZH	Electric cable 6 wires (24 AWG) for strain gauges mV/V or V output
0WE102KE0ZH	Electric cable 2 wires (20 AWG) for strain gauges 4-20 mA output
0L3400MB200	Pair of welding blocks for resistance strain gauges



EMBEDMENT THERMOMETERS

T系累温度计

温度是一个非常重要的测量参数，它可以用来评价结构物自监测开始所获得的各种测量数据在热敏效应作用下的附加影响。Sisgeo 使用三中传感技术来进行温度测量：铂电阻温度传感器 (PT100)，电热敏电阻式温度传感器 (NTC) 和振弦式温度传感器(VW)。

0T111PT1000 PT100 THERMOMETERS CE

传感器类型	PT100 platinum resistance
量程	-50°C +80 °C
分辨率	0.1°C
精度	±0.2°C
直径	20 mm
长度	100 mm
材质	stainless steel

0T3800GKA00 THERMISTORS CE

传感器类型	NTC thermistor (YSI 44005)
量程	-50°C +80 °C
分辨率	0.1 °C
精度	±0.5 °C
直径	12 mm
长度	55 mm
材质	stainless steel

0T2200VW000 VW THERMOMETER CE

传感器类型	vibrating wire
量程	-20°C +80 °C
分辨率	0.1 °C
精度	±0.5 °C
直径	20 mm
材质	166 mm



TEMPERATURE STRINGS

温度弦

温度弦常用来监测钻孔中的温度分布或在养护过程中的大体积混凝土温度。它们由安装在多芯电缆上的RTD或热敏电阻传感器组成。两个传感器之间的间距是根据客户要求定制的。

0TS00RTD000 RTD STRINGS CE

传感器类型	PT100 platinum resistance
传感器数量	until N.4 with 0WE1160LSZH cable until N.8 with 0WE1320LSZH cable
量程	-50°C +80 °C
分辨率	0.1°C
精度	±0.2°C
感测区	Ø20 mm, length 180 mm

0TS00NTC000 THERMISTOR STRINGS CE

传感器类型	NTC thermistor (YSI 44005)
传感器数量	until N.8 with 0WE1160LSZH cable until N.16 with 0WE1320LSZH cable
量程	-50°C +80 °C
分辨率	0.1 °C
精度	±0.5 °C
感测区	Ø20 mm, length 180 mm

CABLES FOR TEMPERATURE STRINGS

0WE1160LSZH	LSZH MULTICORE CABLE, 8 PAIRS
0WE1320LSZH	LSZH MULTICORE CABLE, 16 PAIRS
single conductor	tinmed copper, CU ETP 5649/88
Inner jacket	flame retardant polyolefin
Outer jacket	technopolymer M1, LSZH
Diameter	9.2 mm for 0WE1160LSZH 12.2 mm for 0WE1320LSZH

PENDULUMS & READOUT

垂线/读数仪

- _ ARCH DAMS
- _ CONCRETE DAMS
- _ SKYSCRAPERS
- _ SLENDER STRUCTURES
- _ BELL TOWERS
- _ MINARETS



DIRECT AND INVERTED PENDULUMS 正垂和倒垂

垂线（正垂和倒垂）系统设计用来监测结构物在水平方向的位移变化，它简单易用、可靠而且精确性高。垂线系统在混凝土坝上得到了普遍应用，它们可以精确测量结构垂直度的变化。倒垂系统锚定在坝基内部的不动点之上，与正垂系统结合进行测量，就可以得到一个大坝结构垂直度变化的完整剖面。

OS911002500 DIRECT PENDULUM

The direct pendulum is a gravity-referenced instrument. It consists of:

- stainless steel cylindrical fluid tank with cover
- wire tensioning weight and damping unit
- upper wire anchor system with rail and sliding block
- turnbuckle for trimming the damping unit position

储液罐尺寸	410 mm diam, 415 mm high
材质	stainless steel
Damping fluid (mineral oil)	not supplied

OS912006000 INVERTED PENDULUM

The inverted pendulum provides a fixed datum from which structural movements can be measured. It consists of:

- stainless steel anular damping chamber with cover
- stainless steel floating unit
- adjustable tie bar with 100 mm vertical stroke
- external tube for liquid level survey
- steel ballast for borehole wire anchoring

Tank dimensions	615 mm diam, 497 mm high
Floating unit	allows ± 72 mm movement in any direction
Groutable anchor diameter	75 mm, adjustable from 80 mm to 160 mm by centralized pins, steel
Material	stainless steel
Damping fluid (mineral oil)	not supplied

OWRAC200000 PENDULUM WIRE

材质	stainless steel
直径	2 mm



OPTICAL PENDULUM READOUT 光学垂线坐标仪

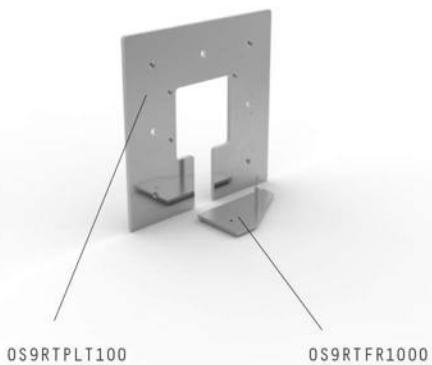
垂线坐标仪是一套可靠而简单的人工测量设备，用来测量垂线系统的水平位移读数。它可以用来观测垂线的水平位移变化，X轴和Y轴的读数以mm为单位通过数字式LCD进行显示。它可以用来固定安装在任何测点进行垂线位移测量，也可以在不同测点临时定位进行移动测量。

OS9RTB15000 MANUAL READOUT

量程	X-axis: 0-150 mm (± 50 mm) Y-axis: 0-150 mm (± 50 mm)
分辨率	0.01 mm
精度	$< \pm 0.1$ mm
防护等级	IP67
工作温度	-20°C $+60^{\circ}\text{C}$
材质	aluminium
规格尺寸	340 x 340 x 115 mm
重量	3.5 kg

ACCESSORIES 配件

OS9RTPLT100	SUPPORT BASE PLATE
材质	galvanized steel
规格尺寸	415 x 415 x 10 mm (LxWxH)
OS9RTFR1000	CALIBRATION FRAME
材质	stainless steel /aluminium
规格尺寸	204 x 120 x 98 mm (LxWxH)



TEL-310S TELECOORDINOMETER 遥测垂线坐标仪

TEL-310S 遥测垂线坐标仪是一种非接触式的自动测量垂线坐标仪，它使用红外二极管（发射/接收）作为传感元件来确定垂线的空间位置。所有测量结果都会自动进行补偿。TEL-310S 遥测垂线坐标仪包含三个部分：SUS（传感单元），CUS（控制单元）和PWS（电源单元）。

OTEL31036S0 TELECOORDINOMETER

传感器类型	非接触式
量程	X轴: 0-150mm; Y轴: 0-60mm;
分辨率	0.005 mm
重复性	X-axis: ± 0.007 mm / ± 0.005 mA Y-axis: ± 0.012 mm / ± 0.007 mA
精度	X-axis: ± 0.010 mA (repeatability+accuracy+hysteresis) Y-axis: ± 0.015 mA
电源	85/230V AC, 50-60Hz
Communication	
- Local readings	Ethernet, USB 2.0
- Remote monitoring	RS485, 4-20mA (to OMNIAlog)
存储容量	2 GB
工作温度	-10°C $+60^{\circ}\text{C}$
Overall dimensions and weight	
- SUS optical unit	630 x 280 x 165 mm, 11.2 kg
- CUS control unit	330 x 345 x 111 mm, 4.8 kg
- PWR power supply unit	330 x 250 x 111 mm, 5.8 kg
可探测电线	minimum 1 mm diam.
防护等级	IP68 until 50 kPa

ACCESSORIES 配件

OTEL310ANS0	ADJUSTABLE MOUNTING BRACKET Material: stainless steel and aluminium Dimensions: 240 x 310 x 170 mm (LxWxH)
OTEL310AND0	BRACKET MOUNTING JIG
OTEL310CAL0	CALIBRATION FRAME
OTEL310XC53	IP68 CABLE FOR RS485 NETWORK
OTEL310X485	RS485 TO USB INTERFACE
OTEL310XC83	IP68 CABLE FOR 4-20 mA NETWORK

READOUTS, DATALOGGERS & ACCESSORIES

读数仪/监测仪器

- _ TUNNELLING
- _ DAM SURVEILLANCE
- _ STRUCTURAL MONITORING
- _ MINING EXPLORATION
- _ DEEP EXCAVATION
- _ LANDSLIDE SAFETY IMPLEMENTATION
- _ RETAINING WALLS
- _ GEOTECHNICAL INVESTIGATION CAMPAIGN



MINI OMNIALOG FIELD LOGGER 小型数据采集仪

Mini OMNIAlog是一款4通道电池供电记录仪，专为现场使用而设计，功耗低。它允许从模拟（VW，mA，V等）和数字仪器读取和存储数据。Mini OMNIAlog可以配备3G / 2G模块，因此读数可以自动传输到用户FTP服务器或电子邮件。

OMNIAMINIO MINI OMNIALOG CE

Processor	ARM Cortex - M3, 20 MHz CPU
A/D 转换	24 bit with auto calibration
测量信号	mA, mV, mV/V, V, °C (NTC), Hz
大容量存储	(VW)
分辨率	2 GB for data and WEB pages
	1 μ A at FS 20 mA
	1 μ V at FS ± 10 mV
	0.001mV/V at FS ± 10 mV/V
	0.1 Hz at FS 400+6000 Hz
精度	0.1 °C for NTC
Analog differential inputs	$\pm 0.05\%$ FS (0.1% FS for NTC)
数字输入	4 channels, configured at factory
数字输出	RS485 digital sensors
Temperature drift	one relay for alarm, 30V, 1A
充电电池	<10 ppm/°C (-30°C +70°C)
Environmental	6 x 1.5V AA not rechargeable
通讯端口	-30°C +70°C, IP67
尺寸和重量	USB 2.0, RS232 for GPRS modem

ACCESSORIES 配件

00MX24V030W	Digital sensor kit to allow miniOMNIAlog to manage up to 64 digital instruments.
0AXB0C022010	90/230 V power supply kit consisting of a 10W 12V AC/DC converter and a plastic box housing the 2.3 Ah battery.
0AX10W003AH	Solar power kit composed by a 10W solar panel with 10 m cable and a plastic box housing the 2.3 Ah battery and charge controller.

CRD-400 MULTIPURPOSE READOUT 多用途读数仪

CRD-400 是一个手持式的读数仪，设计用来采集各种 Sisgeo 公司生产的仪器读数。CRD-400 内置在一个防溅塑料外壳中，带有阳光下可清晰显示的彩色图形显示屏，Ni-MH 充电电池和带有鳄鱼夹的跨接电缆，仪器易于操作使用。CRD-400 可以跟电信号或者工程单位进行数据显示。

CRD-400 READOUT 多用途读数仪 CE

测量信号	mA, mV, mV/V, V, °C, Hz, msec
A/D 转换	24 bit Sigma-Delta (22 true-bit)
显示屏	TFT LCD panel, LED backlighted
分辨率	320 x 240 pixel, sunlight reliable
	1 μ A at FS 20 mA
	1 μ V at FS ± 10 mV
	0.001mV/V at FS 10 mV/V
	0.1 Hz at FS 400+6000 Hz
精度	0.1 °C for PT100 and NTC
充电电池	$\pm 0.01\%$ FS (0.1% for NTC and PT100)
环境条件	
尺寸与重量	4 x AA NiMH, 2450 mAh

SPARE PARTS AND ACCESSORIES 备件和配件

00EABC RD400	Battery charger
	100-240 V AC input
	12 V DC output
00ECAV8P6A00	Clips jumper cable with 6 alligator clips for instrument reading
00ECAV08V2S0	Jumper cable with 2 connectors for reading connectorized instruments
00ECAV08V2S0	Switch jumper cable with 2 connectors for switch panels and measuring boxes

PORTABLE DATALOGGERS 读数仪

New Leonardo 都是耐用、防水而且易于使用的便携式数据采集仪，它们都配备了高性能的微处理器、Ni-MH 充电电池和大屏幕彩色显示屏。SMART MANAGER SUITE 软件允许用户直接通过 PC 进行读数仪信息管理和固件自动更新。

NEW LEONARDO DATALOGGER CE

型多功能读数仪

通道	two (2)
A/D 转换	2 x 24 bit with autocalibration
显示屏	TFT graphic backlight LCD, 5.7" 320 x 240 pixel, sunlight reliable
测量信号	mA, mV, mV/V, V, °C (PT100/NTC), Hz, msec
存储容量	2 GB
分辨率	1 μ A at FS 20 mA
	1 μ V at FS ± 10 mV
	0.001mV/V at FS 10 mV/V
	0.1 Hz at FS 400+6000 Hz
	0.1 °C for PT100 and NTC
精度	$\pm 0.01\%$ FS (0.1% for NTC and PT100)
充电电池	PT100)
尺寸和重量	12 V DC, 4500 mAh Ni-MH
Environmental	200 x 280 x 65 mm, 2 kg
	-20°C +60°C, IP67

GALILEO VW DATALOGGER 振弦式读数仪 CE

通道	two (2)
A/D 转换	2 x 24 bit with autocalibration
显示屏	TFT graphic backlight LCD, 5.7" 320 x 240 pixel, sunlight reliable
测量信号	vibrating wire (Hz, msec), °C (NTC)
存储内存	
存储容量	2 GB
精度	0.1 Hz at FS 400+6000 Hz, 0.1 °C
充电电池	$\pm 0.01\%$ FS (0.1% for NTC)
尺寸和重量	12 V DC, 4500 mAh Ni-MH
Environmental	200 x 280 x 65 mm, 2 kg
COMM port	-20°C +60°C, IP67

READOUTS, DATALOGGERS & ACCESSORIES

读数仪/监测仪器

- _ TUNNELLING
- _ DAM SURVEILLANCE
- _ STRUCTURAL MONITORING
- _ MINING EXPLORATION
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- _ GEOTECHNICAL INVESTIGATION CAMPAIGN



OMNIALOG DATALOGGERS

数据采集仪

OMNIALog 是一个基于 WEB 的数据采集仪，设计用来进行岩土工程安全与结构健康监测应用。OMNIALog 数据采集仪提供广泛的测量和控制功能，它支持各种通讯方式的选择。机身带有键盘和显示屏，可以使用 U 盘进行外部数据存储。OMNIALog 数据采集仪不需要任何专用软件就可以使用 FTP 文件夹或 E-mail 的方式将存储的数据发送给指定用户。

00MNIALOG00 MODULE 型号 CE

处理器	ARM Cortex M3, 120 MHz, 1MB RAM
A/D 转换	24 bit with autocalibration
存储容量	2 GB SD card for data and web pages
模拟输入	N.8 differential expandable by multiplexer (MUX) up to 384 channels
数字输入	N.2 opto-isolated
分辨率	1 μ A at FS 20 mA 1 μ V at FS \pm 10 mV 0.001mV/V at FS 10 mV/V 0.1 Hz at FS 6000 Hz 0.1 $^{\circ}$ C for PT100 and NTC
精度	\pm 0.01% FS (0.1% FS for NTC and PT100)
温度漂移	< 10 ppm/ $^{\circ}$ C over all temp. range
通讯端口	LAN 10/100, USB 2.0, RS232
保护	electro-mechanical relays on every channel and gas discharge tubes on circuit
外接电池	12V DC nominal
工作温度	-30 $^{\circ}$ C +70 $^{\circ}$ C (display -20 $^{\circ}$ C +70 $^{\circ}$ C)

00MNIALOGD0 D-MODULE D-型号 CE

Processor	ARM Cortex M3, 120 MHz, 1MB RAM
A/D转换器	24 bit with autocalibration
存储容量	2GB SD card for data and web pages
数字输入	N.1 opto-isolated
通讯端口	LAN 10/100, USB 2.0, RS232
保护	electro-mechanical relays
外接电池	12V DC nominal
工作温度	-30 $^{\circ}$ C +70 $^{\circ}$ C (display -20 $^{\circ}$ C +70 $^{\circ}$ C)



OMNIALOG CABINETS

集成机箱

Omniolog的通用性和灵活性使得定制的系统能够满足客户需求和项目要求。为了扩展一个编者管理的通道（传感器）的数量，提供了各种具有内部中继多路复用器的“机柜”。每个通道可以独立配置，使多路复用的数量最小化。

COMPONENTS AND ACCESSORIES CE

组成部分及配件

00MNIA CAB20	IP65 cabinet, 00MNIALOG00 module polycarbonate, 500x400x200mm, ready for max No.2 MUX and comm interface
00MNIA CAB2D	IP65 cabinet, 00MNIALOGD0 module polycarbonate, 500x400x200mm, ready for digital power supply kit and comm interface
00MNIA CAB30	IP65 cabinet, 00MNIALOG00 module stainless steel, 600x400x250mm, ready for max No.3 MUX, digital power supply kit and comm interface
00MNIA CAB80	IP65 cabinet, 00MNIALOG00 module stainless steel, 600x600x250mm, ready for max No.8 MUX, digital power supply kit and comm interface
00MN24MUX00	MUX board, 24 channels overvoltage protections on every channel
00MN24V100W	Additional kit for digital instruments including DC/DC 12/24V 100W power supply and No.4 input wiring board

MAIN COMMUNICATION INTERFACES

00MXM0DEM3G	3G Quad band modem Suggested when only data shall be pushed on user FTP server or e-mail.
00MXROUTVPN	HSPA 3G router with VPN service Is the fastest and easy way for remote OMNIALog managing and data download.
00MXROUT4G0	4G LTE router Users can use it only if mobile provider allow both data incoming and outgoing.
00MXF0MMSWT	Optical fiber interface Switch ethernet with multimode optical fiber ports for in/out.



REMOTE MULTIPLEXERS

远程多路复用器

当采用分布式传感器网络时，多路复用器箱为 OMNIALog 机柜提供了一个有效的替代方案。安装在 IP67 盒内的中继多路复用器板作为外围单元操作，它们通过 RS485 总线连接到远程 OMNIALog 数据记录器，远程 OMNIALog 数据记录器控制、收集和存储数据作为网络系统的大脑。

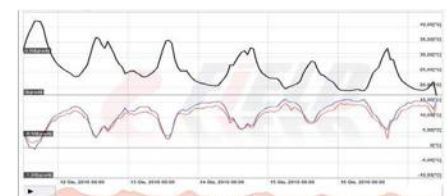
COMPONENTS AND ACCESSORIES CE

组成部分及配件

00MNIA BOX00	IP65 box, 00MNIALOG00 module polycarbonate enclosure, 400x300x180mm ready for external MUX box connection and communication interface
00MN24MUXB0	MUX box, 24 channels inputs polycarbonate enclosure, 300x300x180mm overvoltage protections on every channel
00MN48MUXB0	MUX box, 48 channels inputs polycarbonate, 300x300x180mm overvoltage protections on every channel
0WE610MUXZH	Connecting cable from MUX to MUX or from MUX to OMNIALog datalogger
00MX4MUXEXT	External MUX connection board for maximum No.4 external MUX.
0AXBC022000	IP67 power supply kit AC/DC charger, Vin 85-265 Vac 50-60Hz, Vout 13.2V / 0.9A
0AX00W000AH	Solar power supply package available in different model, including panel, battery and charge controller.

WMS WEB MONITORING SYSTEM

WMS runs inside a dedicated WEB portal and allows authenticated users to access customized pages where many advanced services can be displayed such as raw data automated conversion, manual and automatic data validation, real-time data analysis and graphical display, SMS/e-mail advanced alarms setup, synoptic chart with instruments status alarm, etc...



READOUTS, DATALOGGERS & ACCESSORIES

读数仪/监测仪器

- _ TUNNELLING
- _ DAM SURVEILLANCE
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WR LOG WIRELESS MONITORING SYSTEM

WR 无线监护系统

WR LOG由许多连接仪器的节点和通过无线电与节点通信的网关组成。节点是通过ANDROID APP配置的，而网关在板上有一个用于设置的WEB服务器。节点与网关之间的距离可达15公里。网关可以在FTP服务器上推送数据；可以远程连接到网关进行数据下载和设置。

GATEWAYS

The gateway receive readings from the nodes and push data through the internet to a server for management and visualization.

0LSWR868GW0	868 MHz ISM BAND GATEWAY 10/100 Ethernet, 3G quad band modem
0LSWR915GW0	915 MHz FCC ISM BAND GATEWAY 10/100 Ethernet, 3G quad band modem
0LSWR923GW0	915-928 MHz ISM BAND GATEWAY 10/100 Ethernet, 3G quad band modem

NODES

0LSWR1CHVWS	1 CH VIBRATING WIRE NODE Enclosure 100 x 100 x 61 mm, IP67
0LSWR5CHVW0	5 CH VIBRATING WIRE NODE Enclosure 100 x 200 x 61 mm, IP67
0LSWR4CHANL	4 CH ANALOGUE NODE Enclosure 100 x 200 x 61 mm, IP67
0LSWRD1G000	DIGITAL NODE Enclosure 100 x 200 x 61 mm, IP67
0LSWR02INC15	WIRELESS TILT METER Enclosure 100 x 100 x 61 mm, IP67

SOFTWARE SUITE



READOUT ACCESSORIES AND SPARE PARTS

读出附件和备件

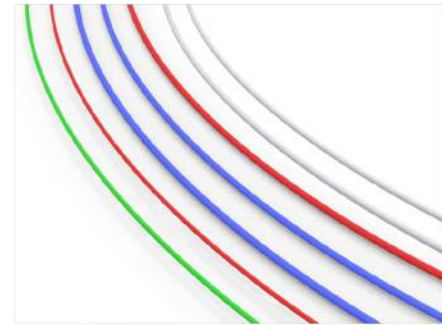
为了简化安装和读取过程，Sisgeo提供各种附件以满足客户的所有要求，如电缆接头套件、连接器、电缆端保护等。电缆接头套件允许在现场用双组分环氧树脂制造电缆接头。

ACCESSORIES 配件

0EGSM0K0200	CABLE SPLICING KIT (2 TUBES) with caps and epoxy resin
0EGSM0K1000	CABLE SPLICING KIT (10 TUBES) with caps and epoxy resin
1000RES2COR	BI-COMPONENT EPOXY RESIN 0.5 Kg pack
0ECON07MY00	FLYING MIL CONNECTOR AND CAP 7 PIN male MIL connector
0ETPOPG0700	CABLE END PROTECTION for cable with OD 2.3 to 6.7 mm
0ETPOPG0900	CABLE END PROTECTION for cable with OD 4.8 to 8.0 mm
0ETPOPG1300	CABLE END PROTECTION for cable with OD 7.0 to 12.0 mm

CDL READOUTS SPARE PARTS

0ECAV7P2A00	JUMPER SHIELDED CABLE, 2 ALL CLIP MIL connector and no. 2 clips + GND
0ECAV7P4A00	JUMPER SHIELDED CABLE, 4 ALL CLIP MIL connector and no. 4 clips + GND
0ECAV7P6A00	JUMPER SHIELDED CABLE, 6 ALL CLIP MIL connector and no. 6 clips + GND
0ECAV07V200	FLYING SHIELDED CABLE, 2 CONN. MIL connector M/F 7 pins
0ECAB12VNMB	BATTERY CHARGER 220V / 12V for Archimede, Galileo and New Leonardo



SIGNAL AND MULTICORE CABLES

电缆

Sisgeo电缆设计用于各种岩土和水文地质应用，可以在土壤中嵌入混凝土或埋。根据最新要求的标准，所Sisgeo信号和多芯电缆都有LSZH（低烟零卤素）护套。

INSTRUMENT CABLES

0WE102KE0ZH	2-LEADS 20-AWG CABLE, KEVLAR Polyolefin + M1 technopolymer jackets
0WE104K00ZH	2-TWISTED PAIRS 22-AWG CABLE Polyolefin + M1 technopolymer jackets
0WE104SG0ZH	2-TWISTED PAIRS 22-AWG CABLE M1 technopolymer red jacket
0WE104X20ZH	ELECTRIC ARMoured CABLE Polyolefin + M1 technopolymer jackets
0WE106LSZH	ELECTRIC CABLE 6 COND. Polyolefin + M1 technopolymer jackets
0WE106IPOZH	ELECTRIC CABLE 6 COND. Polyurethane external jacket
0WE110DX0ZH	ELECTRIC CABLE 10 COND-24 Polyolefin + M1 technopolymer jackets
0WE606IPDZH	EL. CABLE 6 COND FOR DIGITAL IPI Polyurethane external jacket

VENTED CABLES

0WE203KE0ZH	2-LEADS VENTED CABLE, KEVLAR Polyolefin + M1 technopolymer jackets
0WE205KE0ZH	4-LEADS VENTED CABLE, KEVLAR Polyolefin + M1 technopolymer jackets

MULTICORE CABLES

0WE1160LSZH	8-TWISTED PAIRS 24-AWG CABLE Polyolefin + M1 technopolymer jackets
0WE1320LSZH	16-TWISTED PAIRS 24-AWG CABLE Polyolefin + M1 technopolymer jackets

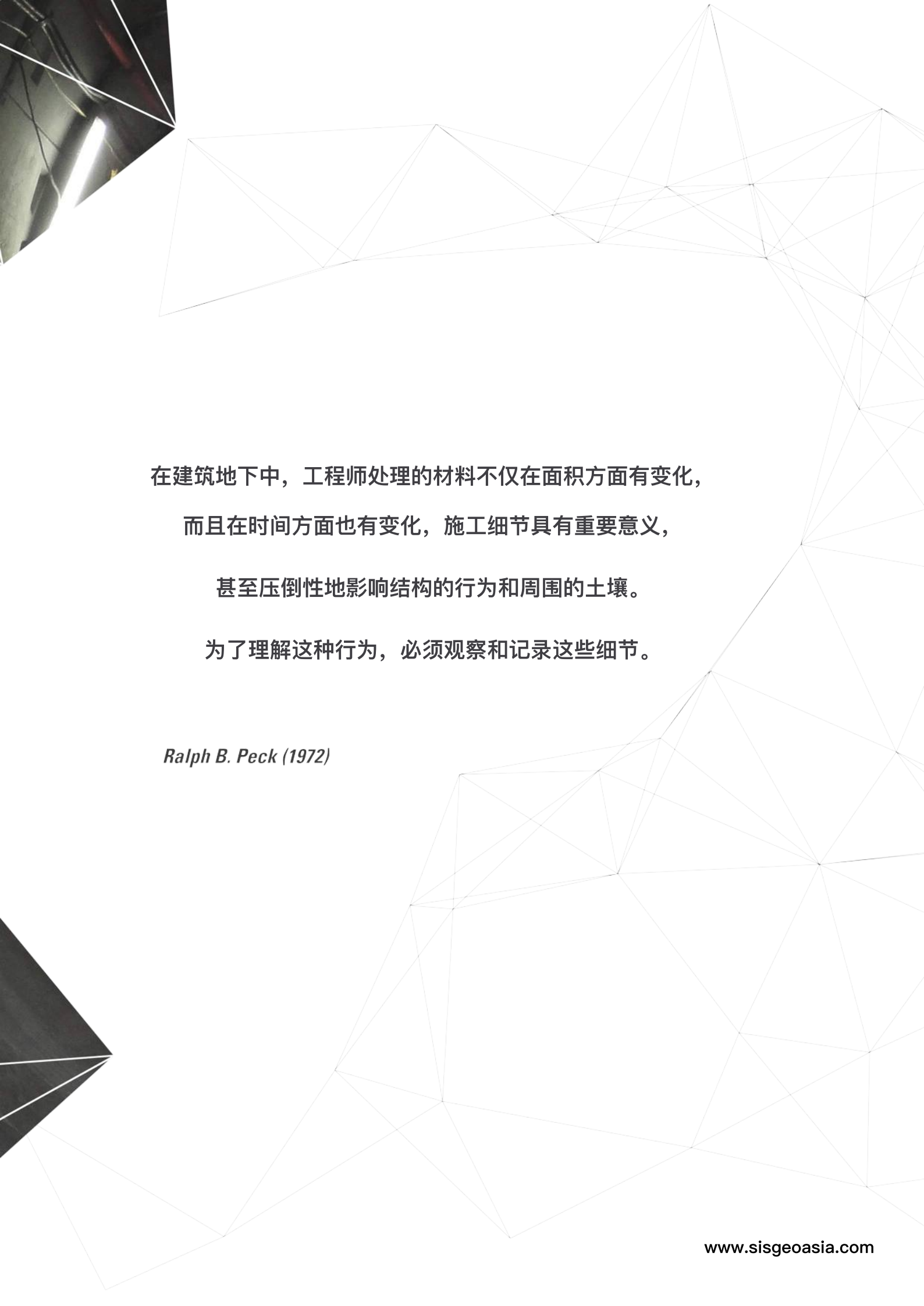
OMNIALOG-MUX CONNECTING CABLE

0WE610MUXZH	OMNIA-MUX CONNECTING CABLE 4+2 twisted pairs, M1 technopol. jacket
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Courtesy of CENTENO RODRIGUEZ & ASOCIADOS S.C.





在建筑地下中，工程师处理的材料不仅在面积方面有变化，
而且在时间方面也有变化，施工细节具有重要意义，
甚至压倒性地影响结构的行为和周围的土壤。
为了理解这种行为，必须观察和记录这些细节。

Ralph B. Peck (1972)



93 Soi Udomsuk 37,
Bang Chak, Phra Khanong
10260 Bangkok - Thailand

info@sisgeoasia.com
Tel: (+66) 02 042 5503