



## CRACKMETERS AND JOINTMETERS

Electrical and vibrating wire crackmeters (jointmeters) are intended to monitor movement across surface cracks and joints in concrete structures or rock.

The instrument assembly includes sensor housing and target, both parts are equipped with screw anchors.

Typically the anchors are bolted on the opposite sides of the joint (crack). The displacement transducer housed in the sensor body is positioned across the joint/crack enabling to measure the changes in the distance between the anchors.

CRID is an integrated automatic system for fissure monitoring of building and monuments reducing the visual impact.

Simple to install and read

Manual or automatic readings by unattended data logger

Operating range up to 150 mm

Corrosion proof and sealed up to 20 Mpa

Triaxial version for multi-axis monitoring



## ELECTRICAL JOINTMETERS

Electrical joint-meter consists of:

- an electrical or vibrating wire displacement transducer housed in a stainless steel body, mounted onto a support. The support has a ball joint which is fitted to a shell anchor to expand into a 14 mm pre-drilled hole;
- a target mounted on a shell expanding anchor having a self-lubricating ball joint;
- a stainless steel rod connecting the displacement transducer to the target;
- an electric cable to the readout station;

The two self-lubricating ball joints allow lateral movements up to  $\pm 10$  degrees in the orthogonal planes (Y-Z axis) without influencing on the operation of the jointmeter.



## TECHNICAL SPECIFICATION

Model	OD313S010VW	OD313S050VW	OD313S100VW	OD313S150VW	OD313SA1000	OD313SA5000	OD313SAE100	OD313SAE500
	OD313S025VW				OD313SA2500			
Type of sensor	vibrating wire linear transducer				linear potentiometer			
Range [mm]	10, 25	50	100	150	10, 25	50	100	150
Total accuracy (linearity, hysteresis and repeatability)	<0.5%FS	<0.5%FS	<0.5%FS	<0.5%FS	<0.3%FS	<0.25%FS	<0.2%FS	<0.15%FS
Resolution	0.01 mm (depending on the readout unit)				0.01 mm (depending on the readout unit)			
Signal output	frequency (VW), ohm (T)				4-20 mA (voltage on request)			
Power supply	-				12 - 24 V DC			
Operating temp.	- 20 °C +80 °C				- 20°C +60 °C			
Sensor housing	16 mm diameter				16 mm diameter			
Anchor distance	250mm ±30mm	300mm ±50mm	400mm ±50mm		300mm ±50mm	500mm ±100mm		
Anchor type	two anchors required for each crackmeter (expanding shell anchor 14 mm diam, 55 mm long)				two anchors required for each crackmeter (expanding shell anchor 14 mm diam, 55 mm long)			
Length [mm] (compressed)	373.383	448	579	710	483,484	533	633	833
Length [mm] (extended)	383.408	498	679	860	593,508	583	733	1033
Material	stainless steel				stainless steel			
Weight [Kg]	0.6	0.7	0.8	0.9	0.5	0.6	0.7	0.8

**CE** electromagnetic compatibility according to EN 61326-1 and EN 61326-A1 directives for EMC emission and immunity

## JOINTMETER/CRACKMETER ACCESSORIES



**OD313A15000** Extension rod for installation of anchors 150 mm further apart

**OD31Y1DTE00** Y-axis stainless steel fixing plate for jointmeters enables installation along Y axis for 2-D measurements

**OD31Z1DTE00** Z-axis stainless steel fixing plate for jointmeters. Used in conjunction with OD31Y1DTE00 realizes 3-D jointmeter

## VIBRATING WIRE EMBEDMENT JOINTMETERS

The embedment jointmeters are designed to monitor movement at construction joints in mass concrete structures such as dams, abutments and foundations.

They are usually buried across the joint to measure the expansion or contractions of the joint. It consists of a stainless steel housing with two targets at the ends; a special design of the internal components of the sensor allows shear movement at the joint.



Model	OD314C100VW	OD314C150VW
Type of sensor	vibrating wire linear transducer	
Range	100 mm	150 mm
Total accuracy (linearity, hysteresis and repeatability)	< 0.5% FS	
Accomodate shear	up to 30 mm (shear movement at the joint)	
Signal output	frequency (VW), Ohm (T)	
Protection level	IP68 (watertight up to 7 MPa)	
Distance between targets	500 mm	
Target diameter	75 mm	
Material	galvanized iron / PVC	

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### Installation method

The jointmeters with its targets is embedded across the joint in the adjacent pours of concrete.

Due to the shear movement of the joint the jointmeter allows a displacement of maximum 30 mm along the orthogonal direction.

Electric cable shall be protected using a reinforced protective plastic tube.

For 3-D installation the concrete pour shall be designed to embed the jointmeter along the Y and Z axis too.

## ELECTRICAL DEFORMOMETERS (Convergence meter)



Model	D313F025VW	D313F050VW	D313FA2500	D313FA5000
Range	25 mm	50 mm	25 mm	50 mm
Type of sensor	vibrating wire linear transducer		linear potentiometer	
Total accuracy (linearity, hysteresis and repeatability)	< 0.5% FS	< 0.5% FS	< 0.3% FS	< 0.25% FS
Resolution	0.01 mm (depending on the readout unit)			
Signal output	frequency (VW), ohm (T)		4-20 mA (current loop)	
Power supply	-		12-24 V DC	
Operating temperature	-20° +80°C		-20° +60°C	
Sensor housing	16 mm diameter			
Sensor fixing plate	340 mm x 35 mm			
Anchor type	three anchors required for each crackmeter expanding shell anchor 14 mm diam., 55 mm long			
Base (wire) length	Up to 10 meter (specify at order)			
Wire	kevlar braided rope with 2 mm nominal diameter invar wire OD 0.33 on request			
Coefficient of linear expansion	kevlar rope $2.3 \times 10^{-6} / ^\circ\text{C}$ , invar wire $1.5 \times 10^{-6} / ^\circ\text{C}$			
Material	stainless steel			
Weight	1.8 Kg		1.8 Kg	

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The electrical deformometer (electrical convergence meter) is used to monitor the displacement between two opposite surfaces and convergence in underground openings and tunnels.

The electrical transducer is housed in a stainless steel body mounted on a fixing plate for wall/floor installation.

A kevlar rope realizes the connection between the transducer and the target. A tail sheave with pulley mounted onto the fixing plate allows to the kevlar rope to move even between two perpendicular surfaces.

The target can be located up to 10 m apart from the transducer and the tensioning of the kevlar rope is guaranteed by means of a spring housed in the sensor body.

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## CRID FISSURE MONITORING SYSTEM

CRID is an integrated system developed for fissure monitoring on buildings and structures reducing the visual impact. The system consists of a set of four miniature electrical sensors (fissure meters), and a small size compact datalogger. CRID enables monitoring of up to four cracks with automatic data measurements and logging. The datalogger is housed in IP67 box and can store up to 43.000 measurements that can be easily downloaded to a portable PC by means of USB cable.



CRID fissure metre



Politeama Theatre - Palermo, Italy

### TECHNICAL SPECIFICATIONS

CRID sensor	OD3CRID2500	OD3CRID5000
Measuring range	0-25 mm ( $\pm 12.5$ mm)	0-50 mm ( $\pm 25$ mm)
Resolution	$\pm 0.2$ mm	
Linearity	0.25% F.S.	
Signal output	voltage	
Operating temperature range	$-20^{\circ}\text{C}$ $+60^{\circ}\text{C}$	
Anchor distance	140 mm $\pm 50$ mm	160 mm $\pm 50$ mm
Anchor type (sensor + target)	No. 4 expansion bolt Fischer 9 mm	
Dimensions	OD 15 mm max length 170 mm	OD 15 mm max length 220 mm
Material	stainless steel	
Waterproof protection	IP67	
Electric cable	4 conductor with shield and PVC jacket	

### CRID DATALOGGER (Product code OAHOB04V120)

Number of channels	4 (four)
Resolution	0.6 mV
Accuracy	$\pm 2$ mV
Reading Storage	64 k (43.000 data)
Commport	USB 2.0
Operating software	Windows/Macintosh
Power supply	3V DC lithium battery (logger) 9V DC lithium battery (sensor)
Operating temp. range	$-20^{\circ}\text{C}$ $+70^{\circ}\text{C}$

### CRID MANAGER SOFTWARE (PRODUCT CODE SWBHW10000)

HOBOWare software's powerful graphing features let you plot and filter data. Analysis functions can be used to extract key information from logged data. These functions actually create new data series, which can be graphed or exported. These functions filter data over user-specified intervals that can be in seconds, minutes, hours or days.

Other features supported are the one-click export to Microsoft Excel® or other ASCII-compatible programs, support for international date and time formats and copy and paste graph images into other programs.

