

D422

**MULTIPOINT
SETTLEMENT SYSTEMS**

SETTLEMENT
GAUGES





MULTIPOINT SETTLEMENT SYSTEMS

The multipoint settlement systems consist of a number of hydraulic settlement gauge connected by tubing to a reference tank located on higher, stable ground.

The settlement gauge is a pressure transducer with vibrating wire or capacitive technology, mounted on a plate with a protective cover. Depending on the requirement, the settlement system can be installed with just a single gauge or with multiple gauges.

The typical application for the multipoint settlement systems is monitoring settlement in embankments, tunnels or other civil structures.

APPLICATIONS

- Settlement monitoring in rockfill or earthfill dams
- Vertical displacement in tunnels
- Settlement control under railway or road embankment

FEATURES

- Automatic barometric compensation (vented pressure gauges)
- Suitable for long term monitoring (vibrating wire gauges)
- Fieldstat software available for enhanced data analysis

 Meet the essential requirements of the EMC Directive 2014/30/UE

OPERATING PRINCIPLE

The system consists of one or more settlement gauges connected via fluid-filled tubing to a reference tank that is located at a stable location.

Each settlement gauge monitors the head of liquid resulting from the difference in elevation of the gauge and the reference tank. The gauge reports a higher head of fluid (higher pressure) if settlement occurs and a lower head of fluid (lower pressure) if heave occurs.

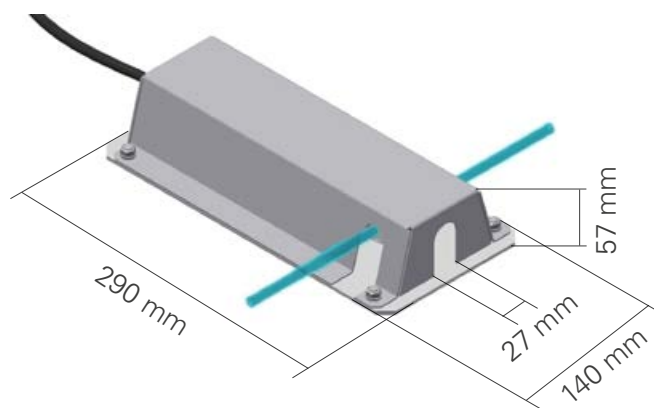
When a vented transducer is used in the gauge, a separate air-filled tube embedded in the signal cable connects each gauge to an air intake located near the reference tank. If a non-vented transducer is used, barometric pressure should be recorded along with the gauge reading for compensation.

SETTLEMENT GAUGES

MODEL	0D422R000MA	0D422R000VW
Technology	capacitive vented pressure transducer with built-in thermistor	vibrating wire non-vented pressure transducer with built-in thermistor
Ranges	20 kPa, 50 kPa, 100 kPa (2.90 psi, 7.25 psi, 14.5 psi)	170 kPa, 350 kPa, 700 kPa (25 psi, 50 psi, 100 psi)
	1.75 m, 4.4 m, 8.8 m with Sisgeo liquid mix (5.7 ft, 14.4 ft, 27 ft with Sisgeo liquid mix)	15.0 m, 30.9 m, 61.8 m with Sisgeo liquid mix (49 ft, 101 ft, 202 ft with Sisgeo liquid mix)
Output signal	4-20 mA (pressure), Ohm (thermistor)	frequency (pressure), Ohm (thermistor)
Sensitivity	<0.006% FS	0.025% FS
Pol. MPE ⁽¹⁾	<±0.1% FS	< ±0.25% FS
Sensor power supply	15 – 24 V DC	-
Typical frequency range ⁽²⁾	-	2250 - 3000 Hz
Max difference in elevation between gauge and reference tank	depends on range of gauge	depends on range of gauge
Materials	stainless steel pressure gauge, galvanized settlement plate, stainless steel protective cover	stainless steel pressure gauge, galvanized settlement plate, stainless steel protective cover
Dimension (WxHxD)	290 x 140 x 57 mm (11.5" x 5.5" x 2")	290 x 140 x 53 mm (11.5" x 5.5" x 2")
Hydraulic tubing	0TUPE060800 (6mm ID, 8mm OD)	0TUPE060800 (6mm ID, 8mm OD)
Signal cable	0WE205KEOZH (4-wire, vent tube, kevlar rope, black)	0WE104X20ZH (4-wire, armoured with steel wire braid, blue)
Max. distance to datalogger ⁽³⁾	1000 m (for more information see FAQ#77)	1000 m (for more information see FAQ#77)

(1) MPE is the Maximum Permitted Error on the measuring range (FSR). In the Calibration Report, the accuracies of the gauge are calculated using both linear regression (≤ Lin. MPE) and polynomial correction (≤ Pol. MPE) (2) The expressed frequency range could has a ±10% variation (3) refer to FAQ section of Sisgeo website: www.sisgeo.com/faq

PHYSICAL FEATURES



REFERENCE TANKS

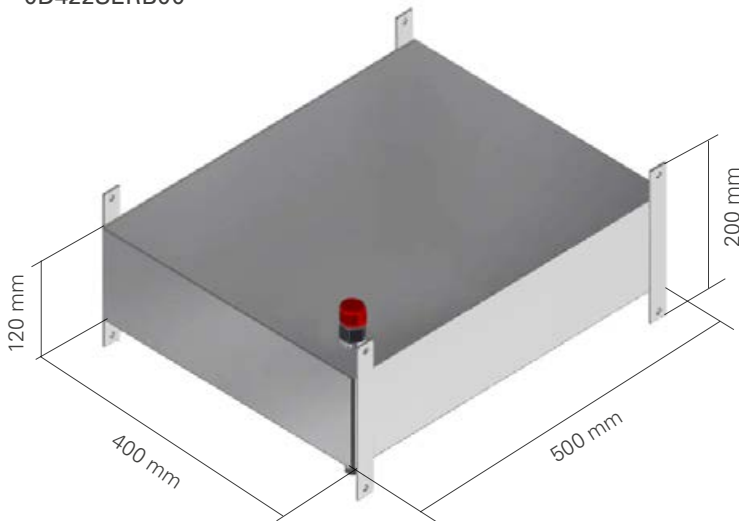
The gauge measures the head of liquid between its elevation and the elevation of the liquid in the reference tank. Two types of reference tanks are available, a simple reference tank and an electrical reference tank.

The level of the liquid in the simple reference tank must be maintained regularly. The level of the liquid in the electrical reference tank is measured, allowing for less maintenance. Tank and transducer readings are recorded together.

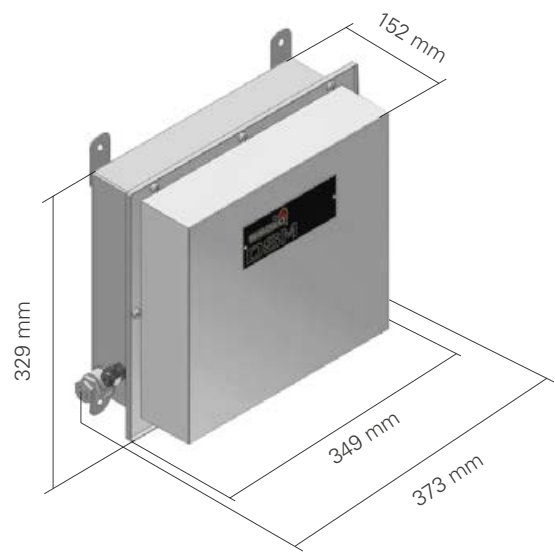
PRODUCT CODE	0D422SERB00	0D422S08000
Description	simple reference vessel	reference gauge
Sensor	none	high accuracy load cell
Material	stainless steel vessel	steel painted box
Overall dimensions (WxHxD)	500 x 400 x 200 mm (20" x16" x 8")	349 x 329 x 152 mm (14" x17" x 6")
Liquid capacity	24 liters (25 qt)	2.5 liters (2.6 qt)

PHYSICAL FEATURES

0D422SERB00



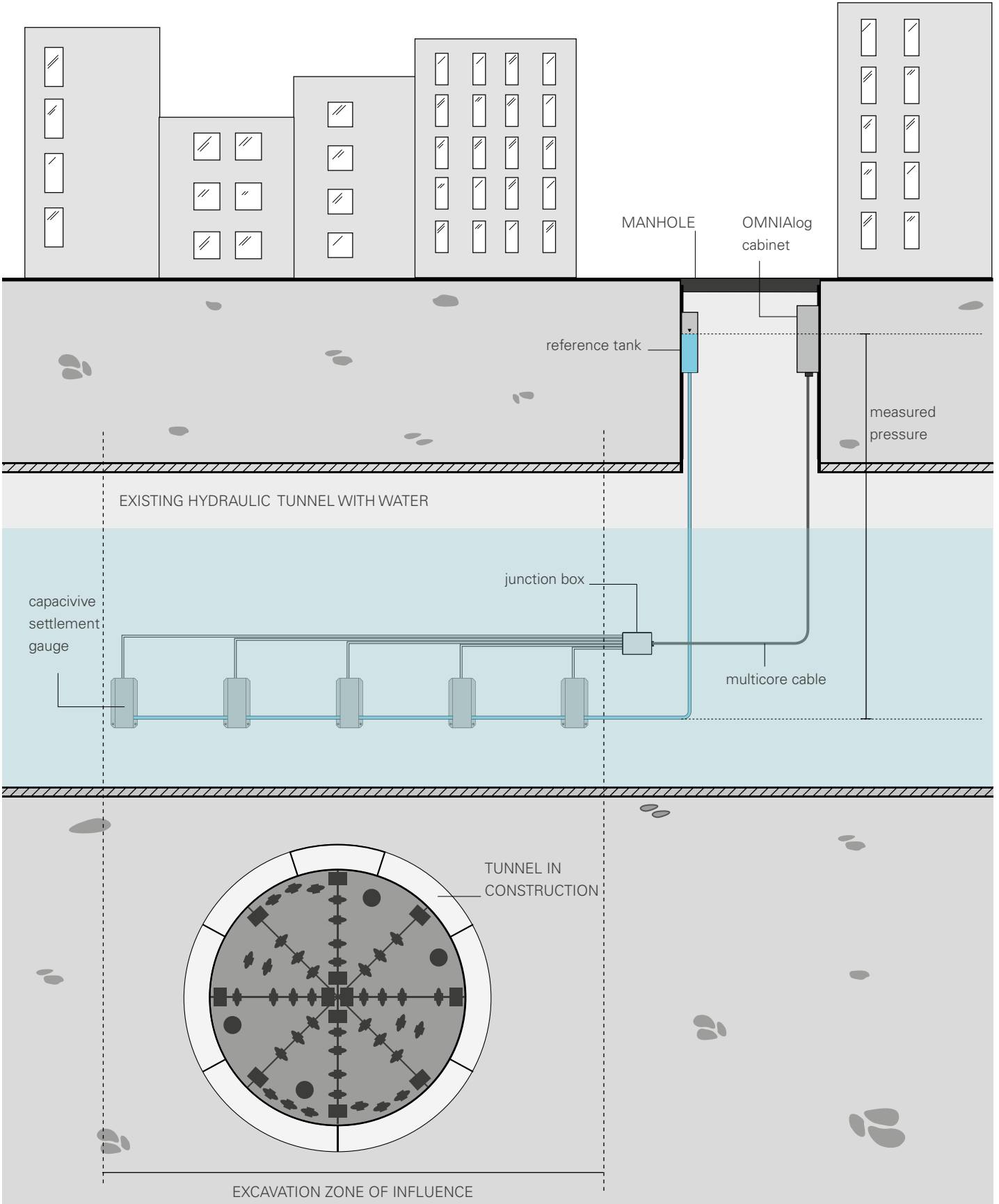
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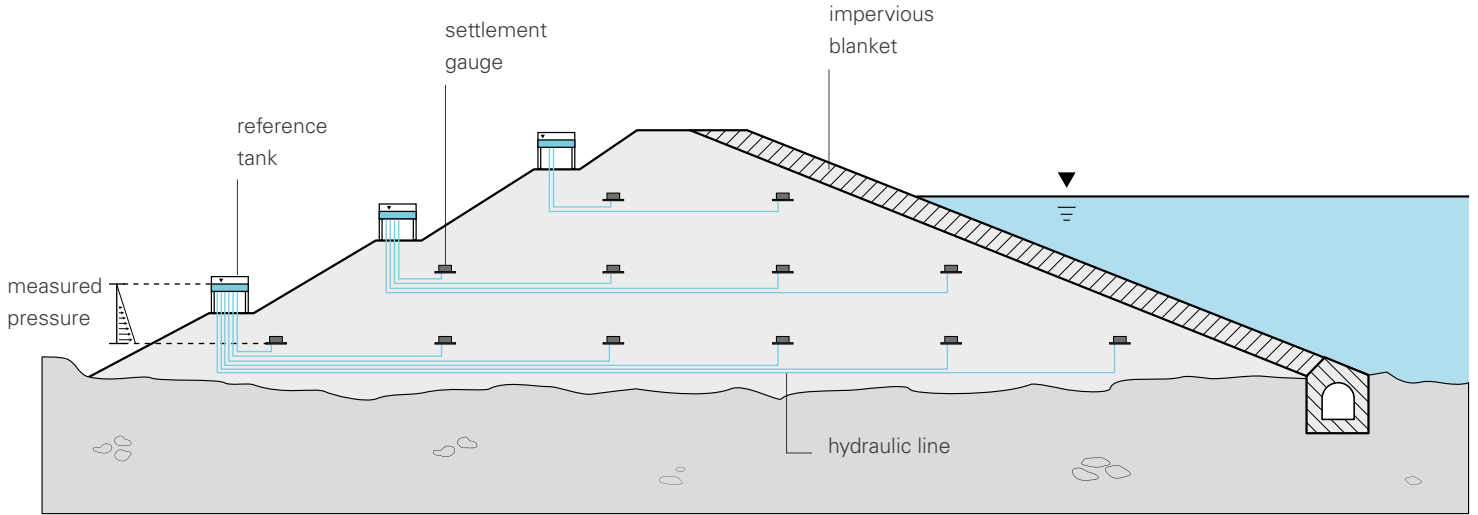
Reference vessels in Sogamoso HPP project, Colombia

APPLICATION IN HYDRAULIC TUNNEL

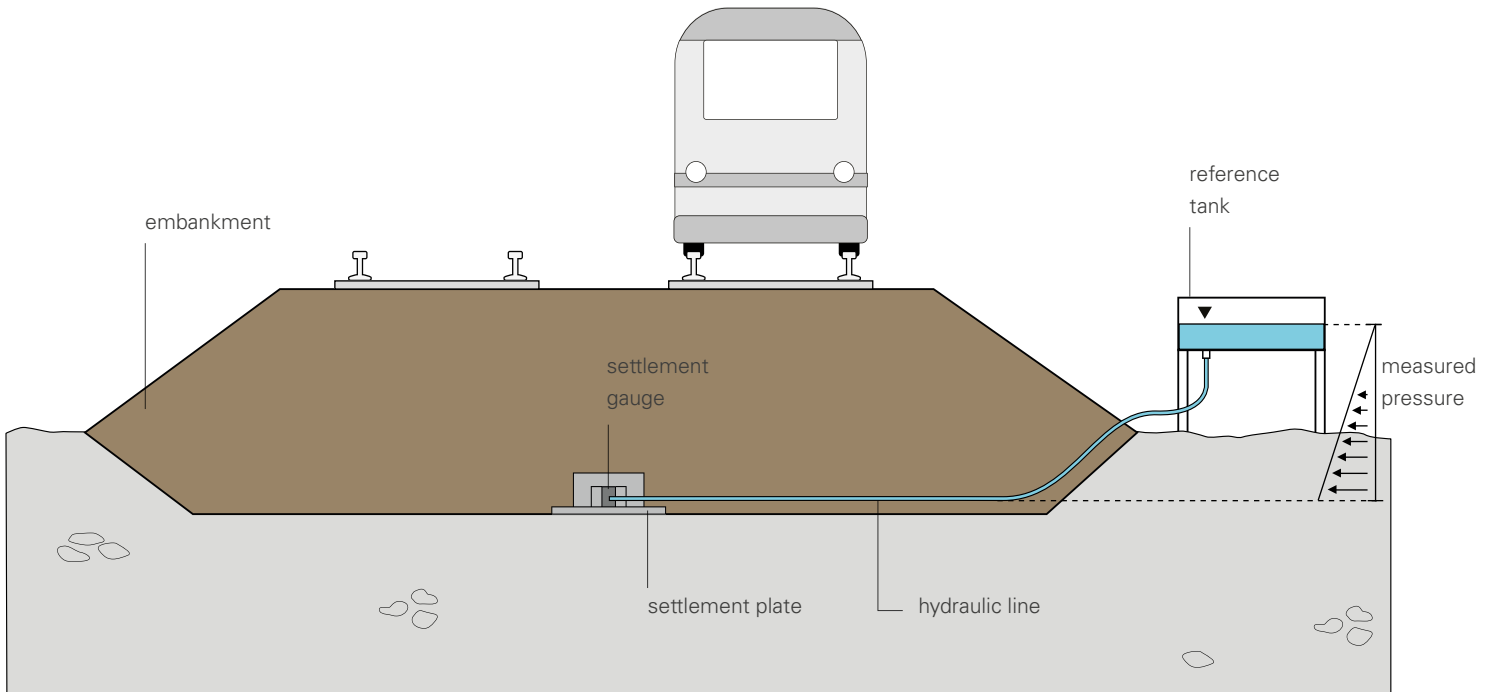
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TYPICAL EMBANKMENT DAM APPLICATION



SINGLE POINT APPLICATION



ACCESSORIES AND SPARE PARTS

BAROMETER OMEPRO106000

Atmospheric pressure gauge, housed in plastic box. Range 800 - 1200 mbar, output 4-20mA current loop.

HYDRAULIC TUBING OTUNY060800

Polyamide tube for hydraulic connection of the settlement gauges. 8 mm OD, 6 mm ID.

SISGEO LIQUID MIX 1000LIGL000

Mixture of 50% glycerine and 50% water, chemically inert, specific gravity 1.156 kg/l. Available in 12 LT and 25 LT tanks.

HYDRAULIC CIRCUIT INSULATION 1000COPE300

Insulated protective tube for hydraulic tubing. Recommended for the lengths exposed to temperature variations. 3m length.

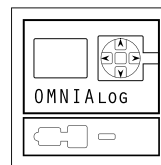
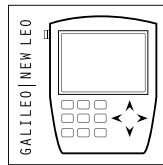
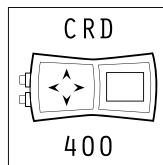
SATURATION DEVICE 0D422SAT200

Saturation device for hydraulic circuit, capacity 20 liters, max pressure 5 bars. Strongly recommended for better results in hydraulic circuit saturation.



Settlement gauge

READABLE BY



Refer to separate datasheets for further information.

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