H-LEVEL

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LIQUID LEVEL SYSTEM

SETTLEMENT
GAUGES

SISGEO

H-LEV_EN_11_04/2026

H-LEVEL

LIQUID LEVEL SYSTEM

The H-Level is an automatic liquid level system for accurate long-term monitoring of differential settlements in buildings, tunnels, and other civil structures.

The system connects multiple H-Level gauges hydraulically to a reference tank installed in a stable location; each gauge measures the liquid head resulting from the difference in elevation between the gauge and the reference tank.

The H-Level system is available with both analog and digital outputs. The digital output allows fast and simple installation and reading. When used with the OMNIAlog datalogger and digital gauges, the logging system can be set up with a single click.

APPLICATIONS

- Buildings
- Tunnels
- Compensation grouting projects
- Deep excavations
- Historical structures
- Bridges

FEATURES

- Barometrically referenced (vented) liquid-level measurement
- Available with analog (4–20 mA) and digital (RS-485 Modbus) outputs
- Integrated temperature monitoring and diagnostics (digital version)

CE *Meet the essential requirements of the EMC Directive 2014/30/EU*

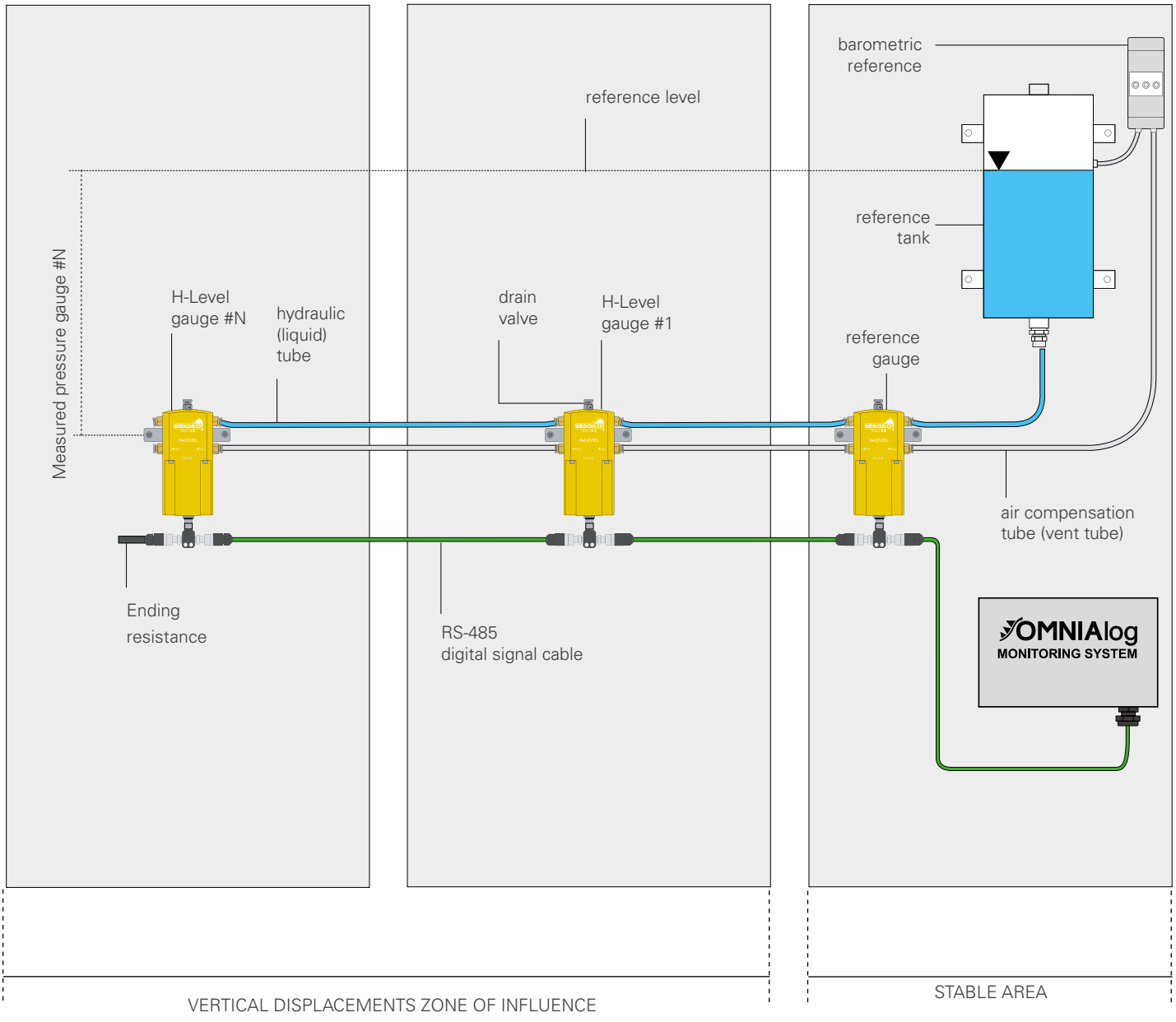
H-LEV_EN_11_04/2026

OPERATING PRINCIPLE

The H-Level system connects a series of H-Level gauges to a single reference tank installed in a stable area. Each gauge measures the liquid head generated by the difference in elevation between the gauge and the reference tank; this head is measured as pressure by the integrated sensor. An air-filled compensation tube connects each gauge to an atmospheric vent located near the reference tank, eliminating the effects of barometric pressure so that the measured values represent relative, barometrically referenced levels.

A gauge installed near the reference tank is used as an internal reference to help compensate for thermal effects along the chain. For installations exposed to freezing conditions, use a de-aerated antifreeze mixture in the tubing and reference tank reservoir (SISGEO recommended mix: 30% glycol / 70% water). As with any hydraulic settlement monitoring system, proper installation of the hydraulic circuit is important to reduce the influence of temperature variations; refer to the Installation & User Manual for detailed guidance.

The H-Level system is available in both analog (4–20 mA) and digital (RS-485 / Modbus) versions.



TECHNICAL SPECIFICATIONS

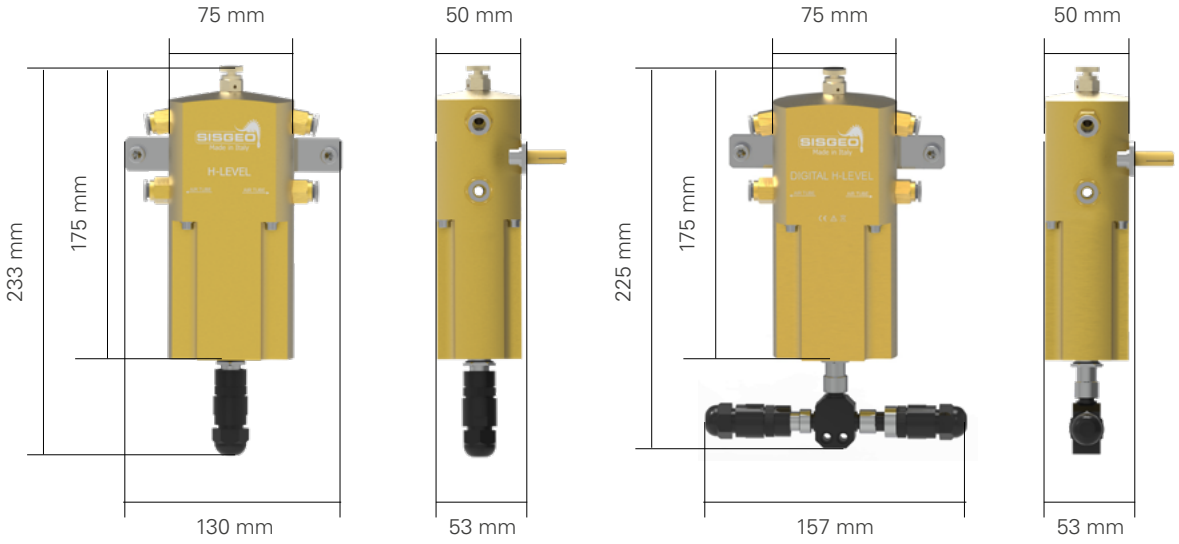
PRODUCT CODES	0HLEV050D02	0HLEV100D02	0HLEV050002	0HLEV100002
Model	Digital H-Level gauge		Analog H-Level gauge	
Measurement principle	ceramic capacitive pressure sensor		ceramic capacitive pressure sensor	
Available ranges (FS)(1)	500 mm H_2O	1000 mm H_2O	500 mm H_2O	1000 mm H_2O
Gauge resolution	0.002% FS		infinite (0.006% FS with OMNIAlog datalogger)	
Gauge sensitivity (2)	see the individual Calibration Report		see the individual Calibration Report	
Gauge accuracy MPE (3)	±0.07% FS (< ±0.35 mm H_2O)	±0.07% FS (< ±0.70 mm H_2O)	±0.15% FS (< ±0.75 mm H_2O)	±0.10% FS (< ±1.00 mm H_2O)
Gauge repeatability	±0.02% FS (< ±0.10 mm H_2O)	to be defined	to be defined	to be defined
Gauge stability after 4 days	±0.06% FS (< ±0.30 mm H_2O)	to be defined	to be defined	to be defined
Output signal	RS-485, Modbus RTU protocol (4)		4-20 mA current loop (pressure), resistance (temperature)	
A/D converter	32-bit, 38 kSPS		-	
Offset (10%FS) temp dependency (-20°C to + 60°C)	< ±0.01 mm / °C	< ±0.03 mm / °C	< ±0.04 mm / °C	< ±0.05 mm / °C
Span (90%FS) temp dependency (-20°C to + 60°C)	< ±0.03 mm / °C	< ±0.05 mm / °C	< ±0.09 mm / °C	< ±0.12 mm / °C
Internal temperature sensor: (5) - nominal range - accuracy (resolution)	Embedded on electronic board - 40°C to +125°C ±1°C within -10°C to +85°C (res. 0.01°C)		Thermistor -40°C +125°C ±0.5°C within 0°C to +50°C (res.0.1°C)	
Internal humidity sensor: (5) - measuring range - accuracy (resolution)	Embedded on electronic board 0 to 100% RH ±5% RH within 0 to 95% RH (res. 0.025% RH)		-	
On-board supply voltage monitor:(5) - measuring range - accuracy (resolution)	Embedded on electronic board 0 to 36 V ±5% FS (res. 0.01 V)		-	
Operating temperature range	-20°C to +70°C		-20°C to +60°C	
Power supply	stable 8-28 V DC		stable 10–30 V DC (recommended 24 V)	
Power consumption	7.5 mA@24Vdc, 11 mA @ 12 Vdc		max 20 mA	
IP class	IP67		IP67	
Liquid and air tubes (OD / ID)	8 mm / 6 mm, polyamide		8 mm / 6 mm, polyamide	
Signal cable	0WE106IP0ZH		0WE106IP0ZH	
Cabling	M12 male connector on the sensor body with 3-port T-shaped splitter for cable wiring		M12 male connector on the sensor body	
Max. distance to datalogger (6)	1000 m (for more information see F.A.Q.#77)		1000 m (for more information see F.A.Q.#77)	

(1) Other ranges available on request
(2) Sensitivity is a specific parameter for every gauge. The sensitivity is calculated during gauge calibration test and reported in the Calibration Report.
(3) MPE = Maximum Permissible Error over the full-scale range (FS). See Calibration Report for details.
(4) RS485 not-optoisolated Modbus communication with RTU Protocol. Default output is "m H_2O". Sisgeo Modbus protocol manual is available for download on SISGEO website.
(5) These sensors are installed on the internal electronic board to give information also in the event of instrument malfunction.
(6) For more information, refer to F.A.Q. section on Sisgeo website: https://www.sisgeo.com

H-LEV_EN_11_04/2026

PHYSICAL FEATURES

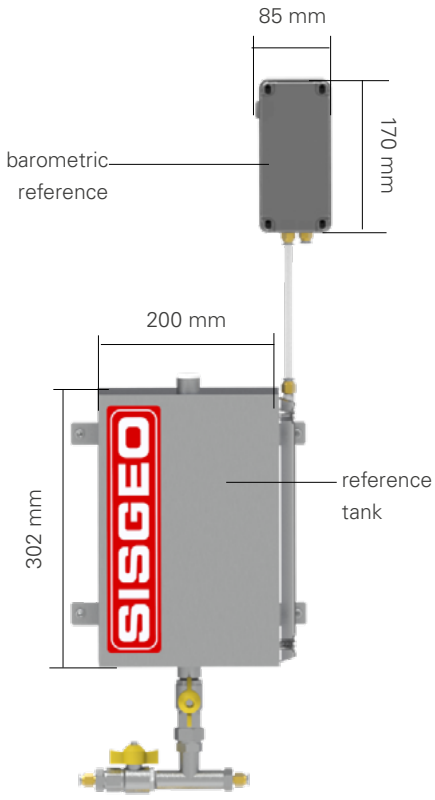
MODEL	Analog H-Level	Digital H-Level
Housing dimensions (WxHxD)	75 x 175 x 50 mm	75 x 175 x 50 mm
Overall dimensions (WxHxD) connectors included	130 x 233 x 53 mm	157 x 225 x 53 mm
Housing material	Anodized aluminum	Anodized aluminum



REFERENCE TANK

The fluid in the reference tank establishes the reference level for all gauges in the system. Barometric pressure is transmitted to the system through a secondary enclosure fitted with a membrane filter and desiccant to reduce moisture.

PRODUCT CODE	0HLEV27SERB
Material	stainless steel (tank), plastic (barometric ref.)
Tank dimensions (WxHxD)	200 x 302 x 102 mm
Tank capacity	about 6 litres
Barometric reference dimensions (WxHxD)	85 x 170 x 66 mm



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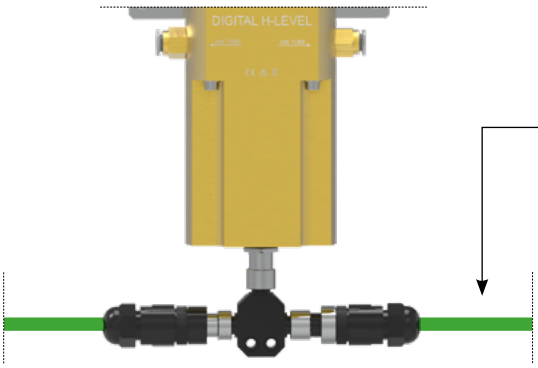
DIGITAL vs. ANALOG VERSION

DIGITAL OUTPUT (suitable for complex monitoring systems)



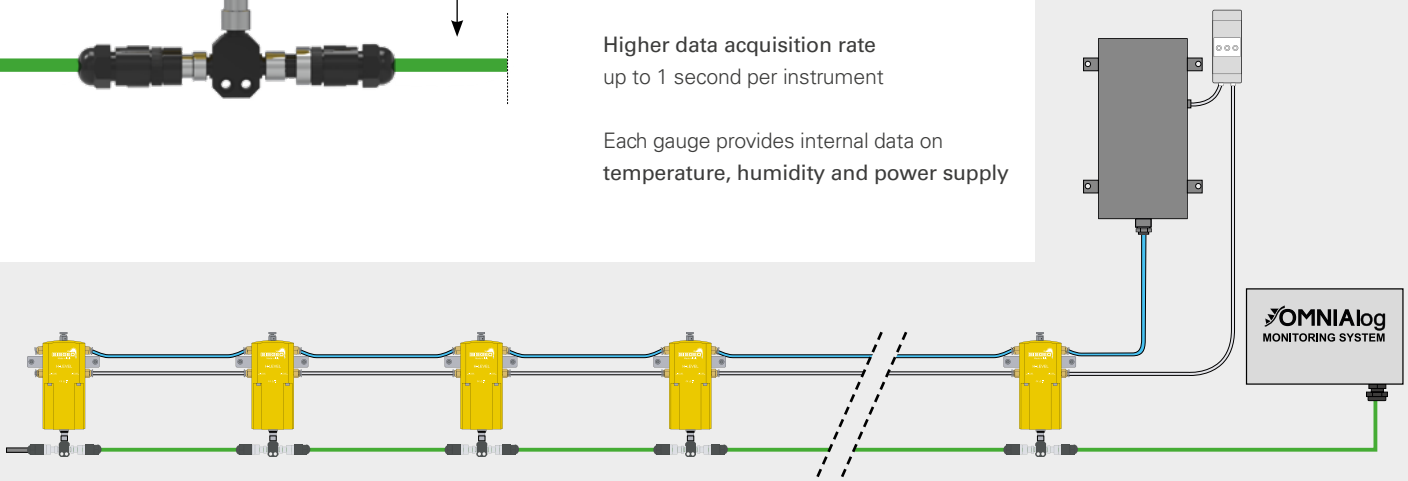
Higher performance in terms of accuracy, resolution and temperature dependance

Faster installation: only one cable for the whole chain

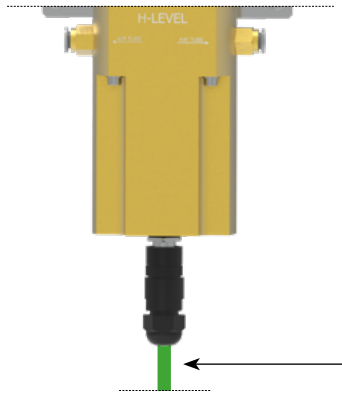
One-click logger setup with OMNIAlog and MiniOMNIAlog

Higher data acquisition rate up to 1 second per instrument

Each gauge provides internal data on **temperature, humidity and power supply**



ANALOG OUTPUT (suitable for simple monitoring systems)



Good performance

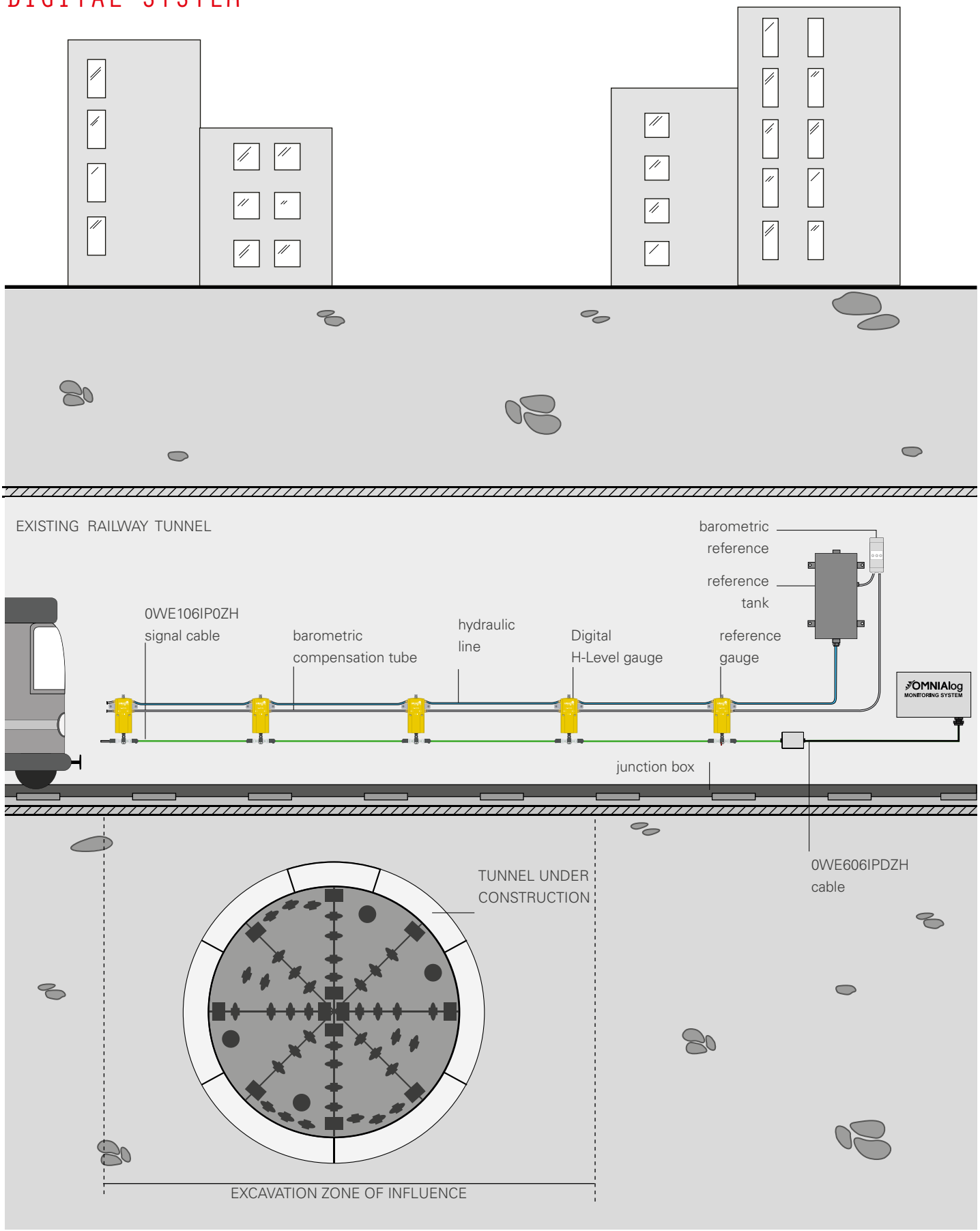
Each gauge has its own cable

Data acquisition interval: about 10 seconds per instrument

Each gauge has an internal temperature sensor

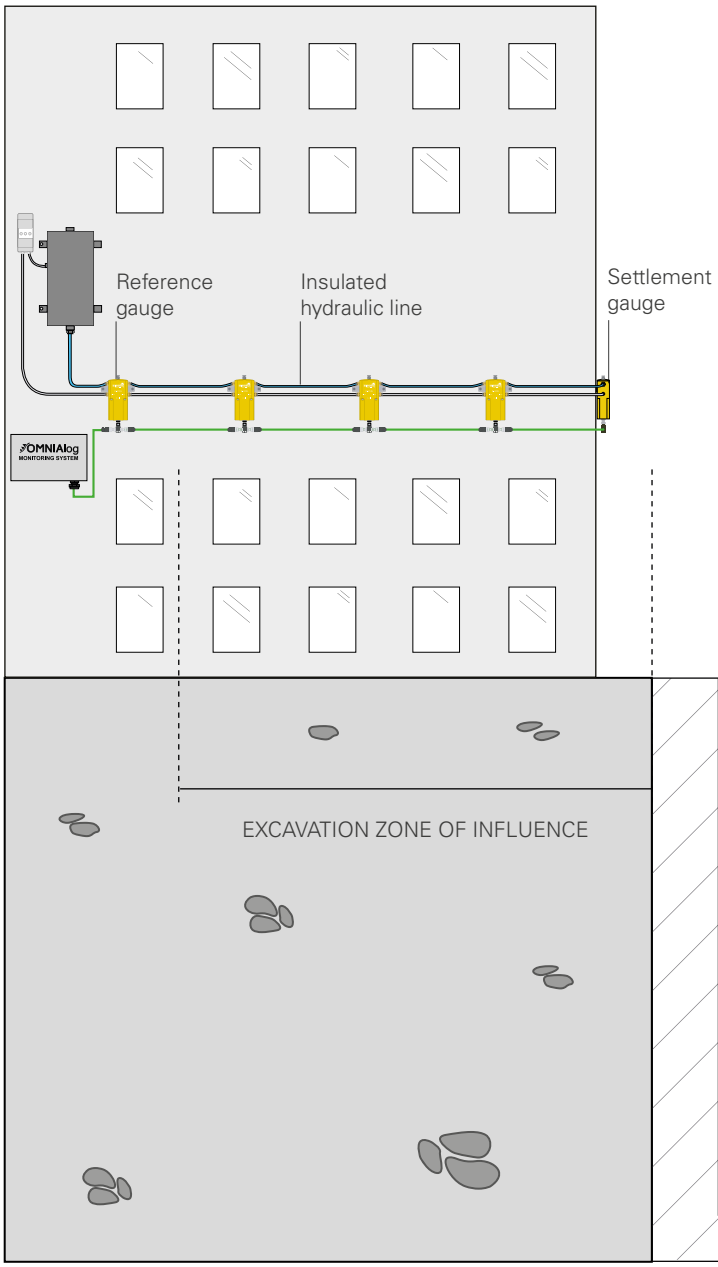
H-LEV_EN_11_04/2026

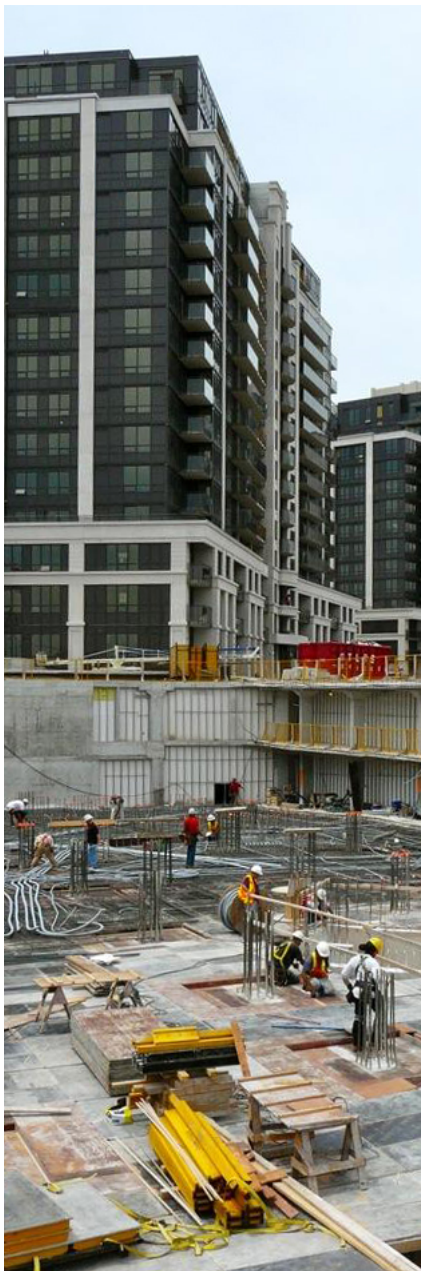
EXAMPLE OF UNDERGROUND MONITORING DURING TUNNEL EXCAVATION DIGITAL SYSTEM



H-LEV_EN_11_04/2026

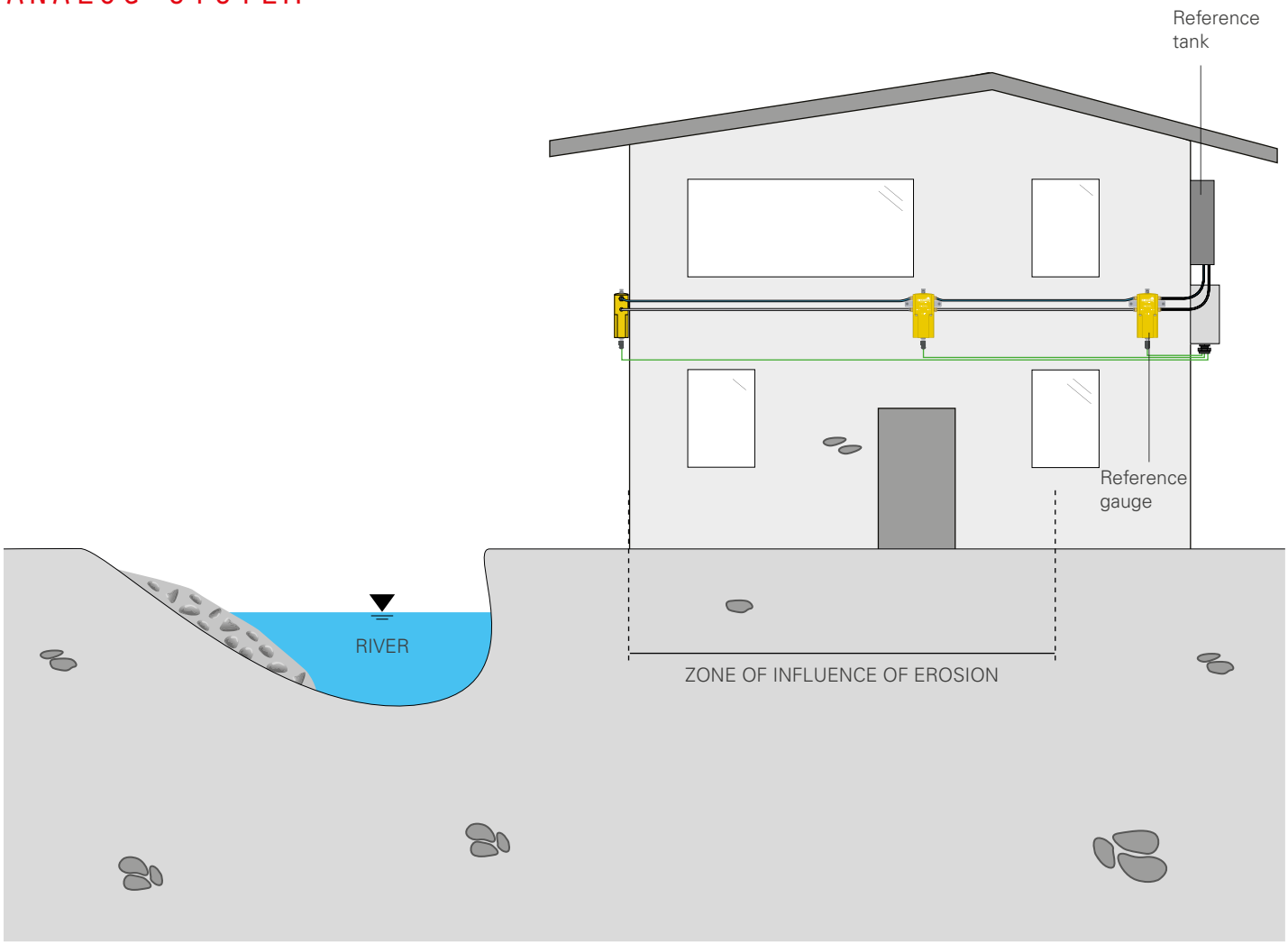
EXAMPLE OF BUILDING MONITORING DURING DEEP EXCAVATION DIGITAL SYSTEM





H-LEV_EN_11_04/2026

EXAMPLE OF SIMPLE BUILDING MONITORING ANALOG SYSTEM



ACCESSORIES AND SPARE PARTS

LIQUID AND AIR TUBE
OTUNY060800

Polyamide tube for both hydraulic and barometric compensation lines.
OD 8 mm, ID 6 mm.

WATER-GLYCOL MIX
1000GL30000

Recommended fluid for the H-Level circuit. It is a chemically inert mixture of 30% glycol and 70% water, allowing operation down to -15 °C. Available in 12 liters and 25 liters containers.

GAUGE REMOVAL KIT
OHLEVKITTB2

Kit to be used in case of H-Level gauge removal from an existing circuit. Composed by two 10cm tubes with hydraulic connections.

SATURATION DEVICE
OD422SAT200

Saturation device for the H-Level hydraulic circuit; capacity 20 liters, maximum pressure 5 bar, 230 V power supply only.

TUBES SPLICING KIT
OHLEVKITJN2

10 hydraulic connections to join liquid and air tubes.

DIGITAL CABLE
OWE606IPDZH

LSZH cable to connect the digital instruments chain from junction box up to OMNIAlog datalogger.

SIGNAL CABLE
OWE106IPOZH

6-wire, 24-AWG cable, with aluminium/ polyester shield and LSZH jacket. 5mm diameter.

DIGITAL JUNCTION BOX
OEPD023IPID

Junction box for chains of digital H-Levels, composed by IP67 plastic box, wiring electronic board and 3 cable glands.

DIGITAL CONNECTORS KIT (SPARE)
OECON05T3K

Kit composed by three complete "T" shaped digital connectors, including three female and three male 5-pins M12 connectors.

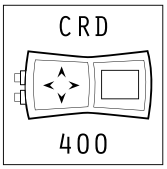
RESISTANCE ENDING DEVICE
OETERMRESIO

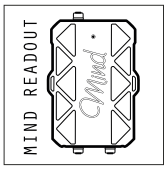
Termination resistor with connector, required to terminate each digital H-Level chain. For more detail see F.A.Q.#076 on SISGEO web site.

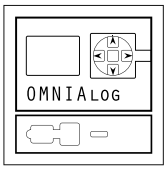
RESISTANCES KIT (SPARE)
OERESIKIT00

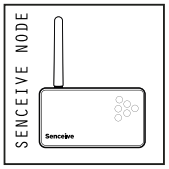
Kit composed by one 120 Ohm, two 240 Ohm, three 360 Ohm and four 480 Ohm resistance ending devices. The M12 5-pin connector allows the connection to SISGEO digital gauges. Check compatibility with old digital gauges with your Sales Representative.

READABLE BY









For further information, refer to the relevant readout datasheets.

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TECHNICAL ASSISTANCE

SISGEO offers e-mail technical support to ensure correct installation and use and to maximize system performance.
For full installation and maintenance procedures, refer to the Installation & User Manual.
For further information, contact: assistance@sisgeo.com