

光纖光柵水準儀 Fiber Bragg Grating Liquid Level Sensor

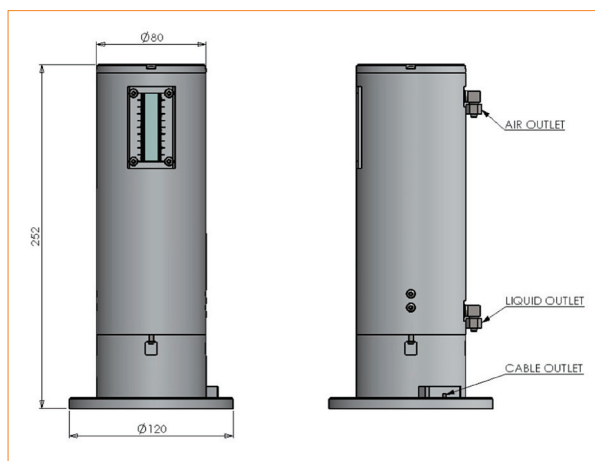
不均勻沉降與偏斜監測系統 Differential Settlement and Deflection Measurement System

光纖光柵水準儀能夠精確地監測儀器內的水位變化，只要把多組光纖光柵水準儀同時連繫到同一參考水位（例如：基準水池或參考水準儀），就可以組成一個不均勻沉降監測系統，監測大範圍的水平沉降變化。這系統十分精確，小至50微米的水平沉降也測量得到。

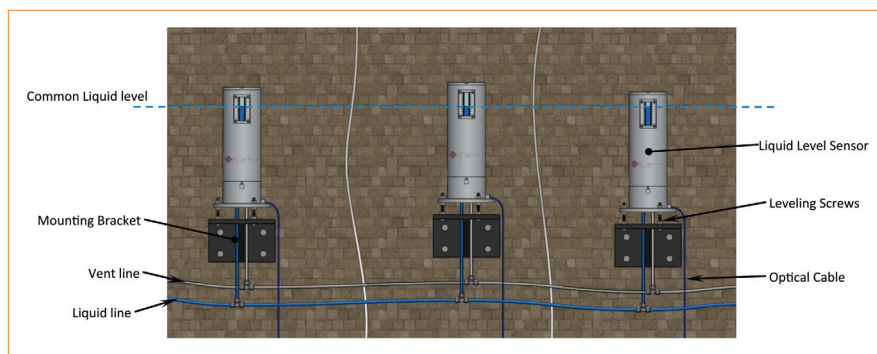
這具水準儀可以與其他光纖光柵傳感器組合成一個全方位光纖監測網絡，只靠單一系統就可以測量一系列的數據，如位移、應變、震動等。



光纖光柵水準儀
Fiber Bragg Grating Liquid Level Sensor



水準儀尺寸大小
Dimensions of the lever sensor



不均勻沉降監測系統的安裝示意圖
Installation of liquid level sensors for differential settlement measurement

The fiber Bragg grating (FBG) liquid level sensor is designed to measure the liquid level inside the sensor chamber. Referencing to a same liquid level (of a liquid reservoir or reference sensor), a group of such sensor interrogated simultaneously by a FBG interrogator can construct a differential settlement measurement system for surface settlement monitoring over a wide area. This system can measure displacement resolution of as small as 50um.

This FBG liquid level sensor can be integrated with other FBG-based sensors with dedicated measurement capability to construct a comprehensive fiber-based sensing network for multiple measurands (displacement, strain, vibration, etc.).

特色與優點

- 精確度高，可監測0.01毫米的垂直位移
- 穩定性高
- 可作長時間實時監測
- 全被動式的儀器，毋需供電
- 毋需連接銅製電纜，不受電磁干擾影響
- 能與其他光纖光柵傳感器組合成一個全方位光纖監測網絡

應用

光纖光柵水準儀能長期監測基建結構（如地基、堤壩、鐵路/公路和隧道）的沉降，並能測量橋樑的偏斜。

TECHNICAL SPECIFICATION

Measurement Range	20 mm
Sensitivity ¹	0.1nm/mm
Resolution ²	0.01mm
Accuracy ³	0.05mm
Temperature Range	-30°C to 80°C
FBG Wavelength	1510-1590 nm

¹ Typical measurement sensitivity
² Measured by an interrogator with wavelength resolution of 1pm
³ Laboratory measurement accuracy, system accuracy is subject to site variables

水準儀技術規格
Technical specification of the lever sensor

Special Features and Advantages

- High resolution of 0.01mm vertical displacement
- High stability
- Continuous real-time and long term measurement
- Completely passive device, no power is required
- No copper cable connection hence immunity to EMI
- Multiplexing of FBG-based vibration, displacement or strain sensors into single system

Applications

Applications of these sensors include long term settlement measurements along foundations, dams, rail/roadways, tunnels and deflection measurement of bridges.

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