



㈜어스이엔지는 전 세계 29개 국가, 40개 지역에 EGS 지열발전/CO2 저장/비전통 유가스전 개발 등의 사업을 위한 미소진동 모니터링과 지진재해와 관련한 활성단층 감시 목적으로 설치, 운영되어 성능을 인정받은 미국 ASIR社 와 심부 시추공 지진계에 대해 2022년 2월 한국에서의 독점사업권 계약을 체결하였습니다.

AF15

P/N 100019



MidLine fixed omni-directional 15 Hz deep borehole seismometer

The AF15 is ASIR's newest readily deployed deep borehole 3-component instrument for use in microearthquake detection and monitoring. It is designed for up to 3000 m depths with each component consisting of three single sensors connected in series. It features the highest current performance level in sensitivity, reliability, and longevity.



Features

- > slim 61 mm outer diameter (OD)
- > passive sensors
- > omni-directional
- > for permanent or temporary installations

Sensor Parameters

Coil Resistance	4350 Ohms \pm 5 %
Depth Range	0 - 3000 m
Distortion	< 0.2 %
Max Motion p-p	4.06 mm
Moving Mass	39.6 g
Natural Frequency	15 Hz \pm 10 %
Damping	0.62 \pm 10 %
Operating Temperature	-40 to +100 °C
Sensitivity	216 V/m/s \pm 10 %
Sensor Type	3 component - fixed
Tilt Tolerance	omni-directional

Sonde Dimensions

Height	1020 mm
Outer Diameter	61 mm
Weight	10 kg

Cable

Delivered standard with 3 twisted shielded pairs, 400 kg Kevlar core, non-armored. Can be supplied with cable to meet customer specified requirements and length.

AG4.5

P/N 100018



MidLine gimbaled 4.5 Hz deep borehole seismometer

The AG4.5 is ASIR's readily deployed deep borehole 3-component seismometer for use in microearthquake detection and monitoring. It is designed for up to 3000 m depths in NQ 3" (76 mm) boreholes with tilts of up to 15°. Features the highest current performance level in sensitivity, reliability, and longevity.



Features

- > slim 61 mm outer diameter (OD)
- > passive sensors on damped gimbal
- > high tilt tolerance of up to 15°
- > for permanent or temporary installations

Sensor Parameters

Coil Resistance	3400 Ohms \pm 10 %
Depth Range	0 - 3000 m
Distortion	< 0.3 %
Max Motion p-p	4 mm
Moving Mass	11.3 g
Natural Frequency	4.5 \pm 0.5 Hz
Damping	0.58 \pm 20 %
Operating Temperature	-40 to +70 °C
Sensitivity	82 V/m/s \pm 7.5 %
Sensor Type	3 component - gimbaled
Tilt Tolerance	15°

Sonde Dimensions

Height	781 mm
Outer Diameter	61 mm
Weight	8 kg

Cable

Delivered standard with 3 twisted shielded pairs, 400 kg Kevlar core, non-armored. Can be supplied with cable to meet customer specified requirements and length.

AF4.5

P/N 100016



SlimLine fixed 4.5 Hz shallow borehole seismometer

The AF4.5 is ASIR's readily deployed shallow borehole 3-component seismometer for use in microearthquake detection and monitoring. The AF4.5 is designed for up to 100 m depths with tilts of up to 3°. Features the highest current performance level in sensitivity, reliability, and longevity.



Features

- > slim 51 mm outer diameter (OD)
- > passive geophone sensors
- > for permanent or temporary installations

Sensor Parameters

Coil Resistance	3400 Ohms \pm 10 %
Depth Range	0 - 100 m
Distortion	< 0.3 %
Max Motion p-p	4 mm
Moving Mass	11.3 g
Natural Frequency	4.5 \pm 0.5 Hz
Damping	0.58 \pm 20 %
Operating Temperature	-40 to +70 °C
Sensitivity	82 V/m/s \pm 7.5 %
Sensor Type	3 component - fixed
Tilt Tolerance	3°

Sonde Dimensions

Height	420 mm
Outer Diameter	51 mm
Weight	2.6 kg

Cable

Delivered standard with 3 twisted shielded pairs, 300 kg Kevlar core, non-armored. Can be supplied with cable to meet customer specified requirements and length.

AF2

P/N 100013



SlimLine fixed 2 Hz shallow borehole seismometer

The AF2 is ASIR's readily deployed shallow borehole triaxial seismometer for use in microearthquake detection and monitoring. It is designed for up to 100 m depths in boreholes as small as 52 mm.



Features

- > slim 51 mm outer diameter (OD)
- > passive geophone sensors
- > for permanent or temporary installations

Sensor Parameters

Coil Resistance	3600 Ohms \pm 10 %
Depth Range	0 - 100 m
Distortion	< 0.9 %
Max Motion p-p	4 mm
Moving Mass	2.7 g
Natural Frequency	2 Hz \pm 20 %
Damping	0.5 \pm 20 %
Operating Temperature	-40 to +70 °C
Sensitivity	22 V/m/s \pm 20 %
Sensor Type	3 component - fixed
Tilt Tolerance	3°

Sonde Dimensions

Height	420 mm
Outer Diameter	51 mm
Weight	2.6 kg

Cable

Delivered standard with 3 twisted shielded pairs, 300 kg Kevlar core, non-armored. Can be supplied with cable to meet customer specified requirements and length.



AFB4.5 장비는 광대역 속도계와 가속도계가 일체화된 제품으로 주파수 대역이 매우 넓어 지열발전에서부터 활성단층감시까지 모든 형태의 지진동 연구에 적용될 수 있습니다. 전통적인 전자기방식이 아닌 광학센서 기반으로 제작되어 방수능력이 탁월합니다. 이런 장점으로 한국지질자원연구원은 한반도 동남권 일대 분포하는 활성단층의 감시를 위한 지진계로 AFB4.5를 선정하였습니다.

AG2

P/N 100012



MidLine gimbaled 2 Hz deep borehole seismometer

The AG2 is ASIR's readily deployed deep borehole 3-component seismometer for use in microearthquake detection and monitoring. It is designed for up to 3000 m depths with tilts of up to 15°. Features the highest current performance level in sensitivity, reliability, and longevity.



Features

- > slim 61 mm outer diameter (OD)
- > passive sensors on damped gimbal
- > high tilt tolerance of up to 15°
- > for permanent or temporary installations

Sensor Parameters

Coil Resistance	3600 Ohms ± 10 %
Depth Range	0 - 3000 m
Distortion	< 0.9 %
Max Motion p-p	4 mm
Moving Mass	2.7 g
Natural Frequency	2 Hz ± 20 %
Damping	0.5 ± 20 %
Operating Temperature	-40 to +70 °C
Sensitivity	22 V/m/s ± 20 %
Sensor Type	3 component - gimbaled
Tilt Tolerance	15°

Sonde Dimensions

Height	781 mm
Outer Diameter	61 mm
Weight	8 kg

Cable

Delivered standard with 3 twisted shielded pairs, 400 kg Kevlar core, non-armored. Can be supplied with cable to meet customer specified requirements and length.

ABB

P/N 100015



MidLine Broadband optical borehole accelerometer

The ABB is our Broadband 3-component accelerometer with optical interferometer sensors for use in low noise environments. It can be installed in 76 mm (or larger) boreholes with tilts up to 15°



Features

- > rugged optical sensors w/ high shock tolerance
- > active sensors with low power consumption
- > high tilt tolerance of up to 15°
- > for permanent or temporary installations

Sensor Parameters

Passband (±3 dB)	0.008 (125 sec) - 1200 Hz
Flat response to acceleration (±1 dB)	0.02 (50 sec) - 300 Hz
Dynamic Range	172 dB
Clip Level	± 0.5 g
Depth Range	0 - 1500 m
Distortion	< 0.03 %
Max V out	60 V pk-pk
Shock Tolerance	> 1500 g
Supply Voltage (Min)	11 V DC
Power Consumption	140 mW for 3 components
Operating Temperature	-35 to +85 °C
Sensitivity	60 V/g
Sensor Type	3-C optical interferometer
Tilt Tolerance	15°

Sonde Dimensions

Height	890 mm
Outer Diameter	61 mm
Weight	8 kg

Cable

Delivered standard with 4 twisted shielded pairs, 400 kg Kevlar core, non-armored. Can be supplied with cable to meet customer specified requirements and length.

ABBT

P/N 100023

MidLine Broadband optical borehole accelerometer with RTD Temperature Probe

The ABBT is our standard ABB Broadband 3-component accelerometer sonde plus a built-in high temperature probe. It can be installed in 76 mm (or larger) boreholes with tilts of up to 15°.



Features

- > rugged optical sensors with high shock tolerance
- > active sensors with low power consumption
- > high tilt tolerance of up to 15°
- > for permanent or temporary installations
- > industrial RTD temperature probe

Sensor Parameters

Passband (±3 dB)	0.008 (125 sec) - 1200 Hz
Flat response to acceleration (±1 dB)	0.02 (50 sec) - 300 Hz
Dynamic Range	172 dB
Clip Level	± 0.5 g
Depth Range	0 - 1500 m
Distortion	< 0.03 %
Max V out	60 V pk-pk
Shock Tolerance	> 1500 g
Supply Voltage (Min)	11 V DC
Power Consumption	140 mW for 3 components
Operating Temperature	-35 to +85 °C
Sensitivity	60 V/g
Sensor Type	3-C optical interferometer
Tilt Tolerance	15°

Sonde Dimensions

Height	890 mm
Outer Diameter	61 mm
Weight	8 kg

Cable

Delivered standard with 6 twisted shielded pairs, 800 kg Kevlar core, non-armored. Can be supplied with cable to meet customer specified requirements and length.

AFB4.5

P/N 100017



Optical Borehole Fullband High Sensitivity Accelerometer + 4.5 Hz seismometer

The 6-component AFB4.5 is a deep borehole sonde for use in all types of earthquake studies. Combining a low power, high sensitivity optical accelerometer and a standard 4.5 Hz geophone, it covers the full earthquake and rapid ground-deformation spectrum. The AFB4.5 is designed for up to 1500 m depths in NQ 3" (76 mm) boreholes with tilts up to 15°. The gimbaled 3-C 4.5 Hz sensor adds an additional level of redundancy as well as high frequency response.



Features

- > coverage of the full earthquake spectrum
- > combination of active and passive sensors
- > high tilt tolerance of up to 15°
- > for permanent or temporary installations

Sensor Parameters

Sensor Orientations	6-C: A xyz plus V, H1, H2
Depth Range	0 - 1500 m
Tilt Tolerance	15°
Operating Temperature	-40 to +85 °C
Passband (±3 dB)	0.008 (125 sec) - 1200 Hz
Dynamic Range	172 dB
Supply Voltage (Min)	11 V DC
Power Consumption	140 mW for 3 comp.
Sensitivity	60 V/g
Clip Level	± 0.5 g
Natural Frequency	4.5 ± 0.5 Hz
Sensitivity	82 V/m/s ± 7.5 %
Coil Resistance	3400 Ohms ± 10 %
Damping	0.58 ± 20 %
Moving Mass	11.3 g
Max Motion p-p	4 mm

Sonde Dimensions

Height	1127 mm
Outer Diameter	61 mm
Weight	10 kg

Cable

Delivered standard with 7 twisted shielded pairs, 1400 kg Kevlar core, non-armored. Can be supplied with cable to meet customer specified requirements and length.