SERCEL

# Geophones

SEISMIC SENSORS

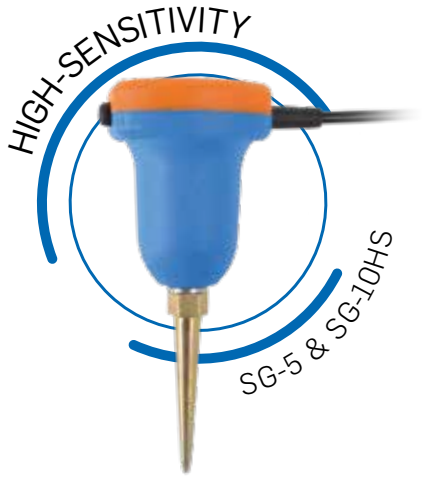
# GEOPHONES

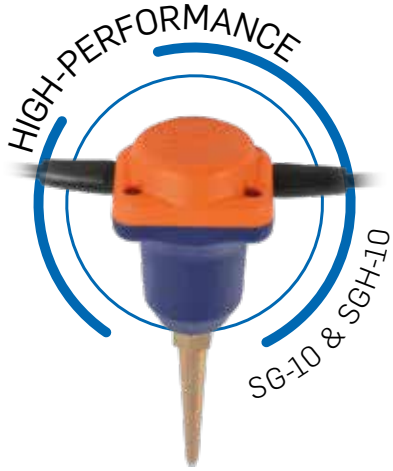
## A COMPLETE PRODUCT LINE

Sercel has a long history in being at the forefront of developing new cutting-edge technology. Setting new standards for sensors is no exception. Our advanced recording systems are capable of precision measurement for all of today's seismic requirements for the highest reliability, consistent quality and robust operational field efficiency.

In addition to design and manufacturing of seismic sensors, Sercel is committed to testing all products to maximize quality control. We ensure that every sensor is tested and qualified to meet the requirements for each specific project.

As the leading designer and manufacturer of precision sensors, Sercel provides a diversified sensor portfolio of field-proven sensor equipment for any environment and any project condition.




# ANY SURVEY CONDITION

# ANY ACQUISITION SYSTEM

# HIGH-SENSITIVITY

## SG-5, SG-10HS & SG-10HS 3C

SG-5 & SG-10HS feature a high sensitivity comparable to a string of multiple geophones.

Especially designed for single sensor applications, they enables fast field deployment with lighter weight and full compatibility with 508$^{XT}$ land acquisition systems.

A 3-C version, SG-10HS 3C, is also available.

### BETTER PERFORMANCE

High sensitivity
Low distortion

### IMPROVED OPERATIONAL EFFICIENCY

Lighter and easier to deploy than an array of geophones

### EXTREME WORKING CONDITIONS

Operating temperature : -40°C / +80°C

| At 22°C | SG-5 | SG-10HS | SG-10HS 3C |
|---|---|---|---|
| Operating position | 1-C vertical | | 3-C |
| Natural frequency | 5Hz ± 7.5% | 10 Hz (± 3.5%) | |
| Distortion | ≤0.075% | ≤0.1% | |
| Sensitivity | 80 V/m/s± 5% | 85.8 V/m/s (± 3.5%) | |
| Operating Temperature | -40°C to +80°C | | |

Specifications subject to change without notice

# HIGH-PERFORMANCE

## SG-10 & SGH-10

SG-10

### CLEARER IMAGE

Very Low distortion: < 0.075%

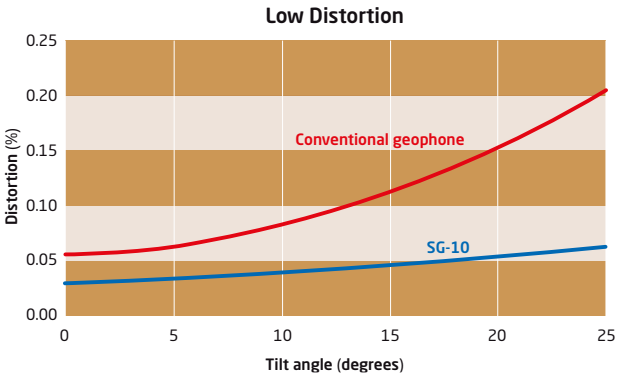
### HIGHEST RELIABILITY

Demanding Validation Process

### EXTREME WORKING CONDITIONS

Operating Temperature: -40°C / +70°C

The SG-10 was developed utilizing rare-earth magnet technology to achieve very low distortion and the highest tilt tolerance in the industry. This technology, coupled with a specific magnetic geometry, results in one of the most advanced geophones in the seismic industry.




| | SG-10 | SGH-10 |
|---|---|---|
| Operating position | Vertical | Horizontal |
| Natural frequency | 10 Hz (± 2.5%) | |
| Distortion | < 0.075% | |
| Intrinsic sensitivity | 22.8 V/m/sec (±2.5%) | |
| Operating temperature | -40°C / +70°C | |

# CONVENTIONAL

## JF-30DX

JF-30DX

### BETTER PERFORMANCE
Low distortion geophone

### HIGH RELIABILITY
Strict quality process

### CUSTOMER FOCUSED
Fully customizable sensor array

The 30DX is a highly reliable geophone suited for any type of land or marsh seismic applications. Developed using rare-earth magnet technology the 30DX features a low distortion and a high spurious frequency providing high data quality recording capabilities.

The new 30DX is manufactured using Sercel-Junfeng know-how under strict quality control processes well beyond specifications requirements, to ensure the best performance in the toughest environments.

# FULLY CUSTOMIZABLE

| | Land strings  | | Marsh strings  |
|---|---|---|---|
| **CASE** |  Steel spike |  Tripod | Standard conditions  |
| **LINE CABLE**  | Dry ø5.3mm | | Waterproof ø5.8mm for assembled T-junction |
| | Waterproof ø5.3mm | | Waterproof<br>High protection ø6.35mm<br>for overmoulded T-junction |
| **DROP CABLE**  | NA | | Waterproof ø7.9mm |

| Land strings connectors | | Land & Marsh strings connectors | |
|---|---|---|---|
|  SH2M |  SH2M WCR |  SH2F |  WPC-2A |
|  SH17 |  SH17 WCR |  SH2F WRC | |

# OMNI-TILT HT

## SGHT-15

GeoWave® II

### CLEARER IMAGE

Very Low distortion: < 0.075%

### HIGHEST RELIABILITY

Demanding Validation Process

### EXTREME WORKING CONDITIONS

Operating Temperature: -40°C / +70°C

The SGHT-15 is a new high temperature omni-tilt geophone. Qualified up to 205°C, it is compatible with all vsp tools in the market.

Its high sensitivity specifications make it also well adapted to microseismic and hydraulic fracturing monitoring surveys.

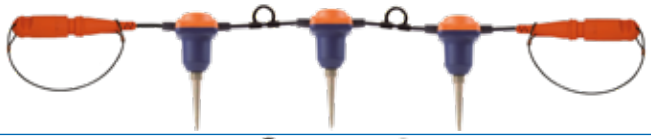
| | Nominal | Horizontal | 0° to 180° |
|---|---|---|---|
| Natural frequency | 15 Hz | ± 5% | -5% to +15% |
| Coil resistance | 2350 Ω | ± 5% | ± 5% |
| Sensitivity | 52.0 V/m/s<br>(1.32 V/in/s) | -15% to +5% | -15% to +5% |
| Open circuit damping<br>(without damping resistance) | 0.50 | -15% to +15% | -20% to +15% |
| Distortion<br>(@ 15 hz & 1.8 cm/s pk-pk)<br>(@ 15 hz & 0.7 in/s pk-pk) | | ≤ 0.2% | ≤ 0.9% |
| Spurious frequency | | ≥ 365 Hz | ≥ 280 Hz |
| Coil excursion pk-pk | | <3.0 mm (<0.118 in) | <0.6 mm (<0.024 in) |
| Moving mass | 7.4 g | | |

Note: Sercel reserves the right to change its specifications without prior notice.
All specifications are typical at 20°C

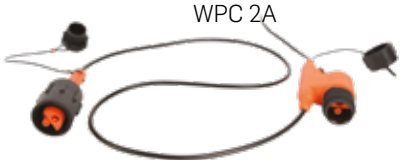
# LAND STRINGS

Exceeding today's operational field requirements and meeting customer demands, our strings are custom-built to fit any project, when you need it, where you need it, at anytime. Our high-performance cases are designed to withstand a wide range of environmental conditions are functional in diverse land areas such as desert, urban, forest and arctic regions.

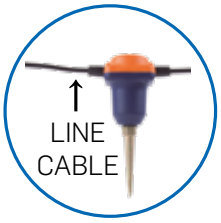
# STRING TYPES

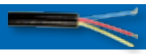
| | | |
|---|---|---|
| Standard (male) |  | |
| Reversible (male/male) |  | The reversible string gives the ability to connect from any side providing more flexibility during deployment. |
| Extension (male/female) |  | The extension string enables to connect strings to each others to an unlimited number as to adapt for any configuration. |

# CONNECTOR TYPES

| | Water-resistant | Waterproof (-15m) or Cold weather (<-10°C) |
|---|---|---|
| Single (male) | SPC 2AM  | WPC 2AM  |
| Double (male/female) | SPC 2A  | WPC 2A  |

# LINE CABLE TYPES




|  | Diameter | Breaking strength | Spec. weight |
|---|---|---|---|
| Dry | Ø 5.3 mm | 90 daN | 34 kg/km |
| Waterproof (-15m) | Ø 5.3 mm | 90 daN | 34 kg/km |
| Waterproof High protection (-15m)* | Ø 6.35 mm | 90 daN | 44 kg/km |

* with BG4 case type only

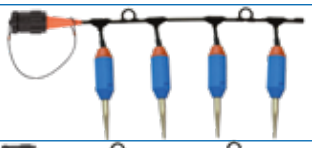
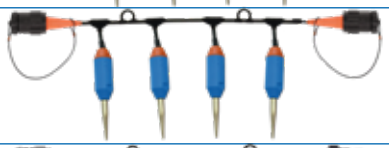
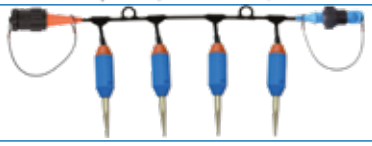
# CASE TYPES

| | Tripod | Steel spike | Brass spike | |
|---|---|---|---|---|
| BG3 |  |  |  | Compatible with JF-20DX sensors and SG-10 sensors |
| BG4 |  |  | | Reinforced case type Specially designed for SG-10 sensors |

# MARSH STRINGS

Our commitment to meet and surpass customer needs is answered by the development of a dedicated sensor string for marsh zones. It has been specially designed for easily burying the sensors in the ground and getting the best coupling. Designed to function in wet conditions, our marsh zone sensor strings include a specific metal casing for ice and snow conditions. Our custom-built strings are designed to fit any project, when you need it, where you need it, at anytime.

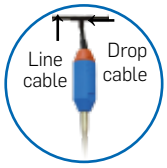
# STRING TYPES

| | | |
|---|---|---|
| Standard (male) |  | |
| Reversible (male/male) |  | The reversible string gives the ability to connect from any side providing more flexibility during deployment. |
| Extension (male/female) |  | The extension string enables to connect strings to each others to an unlimited number as to adapt for any configuration. |

# CONNECTOR TYPES

| | Waterproof (-15 m) |
|---|---|
| Single (male) | WPC 2AM  |
| Double (male/female) | WPC 2A  |

# CABLE TYPES




|  | Diameter | Breaking strength* | Weight |
|---|---|---|---|
| LINE CABLE | Ø 5.3 mm | 90 daN | 34 kg/km |
| DROP CABLE | Ø 7.9 mm | 110 daN | 68 kg/km |

** Bulk Only*

# JUNCTION TYPE

**Molded**

The T-junction is overmolded on the line and drop cable

**Assembled**

The T-Junction is an assembly enabling easy repair of the line or the drop cable

# CASE TYPES

**Marsh conditions**

Standard casing

**Snow and ice conditions**

Casing reinforced with a metal sleeve

# GEOPHONE TESTER SGT-II

## HIGH ACCURACY

Temperature correction factor

## IMPROVED ERGONOMICS

Sunlight & backlight LCD
PC connection capability
Simple user interface

## ERROR PROOFING

Green or Red LED status
Sound & LCD text results
Automatic upload/download

SGT-II is the new portable and universal geophone string tester. Equipped with a temperature sensor, as to apply correction factors for the highest accuracy. Designed for in-field testing, this rugged generation integrates new error proofing features & improved ergonomics.

| SGT-II | |
|---|---|
| Battery autonomy | 14h @ 25°C |
| Storage capacity | 20 000 + records |
| Operating temperature | -20°C / +50°C |
| Protection | IP67 |

## CAPABILITIES

- Natural frequency
- Coil resistance
- Damping
- Sensitivity
- Harmonic distortion
- Dynamic impedance
- Leakage

# SEISMOMETERS

## L-4 High-Sensitivity Seismometer

The L-4 is designed specifically for scientific studies, yet has the ruggedness required for small petroleum exploration work. L-4 is available with or without calibration coils and may be obtained as a single element or as a 3D package.It is also available either in vertical or horizontal version.

| Natural frequency | |
|---|---|
| L-4C | 1 Hz |
| L-4C 3D | |
| L-4A | 2 Hz |
| L-4A 3D | |

## L-10 Digital Grade Industrial Subminiature geophone

The L-10 geophone is a small rugged unit with a high output. It is packaged in a high strength Nylon case for the lowest weight specifications.

| Natural frequency | |
|---|---|
| L-10 AR | 10 Hz |
| L-10 AR | 14 Hz |
| L-10 B | 4.5 Hz |

## L-22 Miniaturized Seismometer

The L-22 unit is a miniature, low frequency, land seismometer which is available in a 2.0 Hz model. It is a precise instrument, and maintains close frequency tolerance with tilt and temperature variation. L-22 is available as a single or 3D unit.

| Natural frequency | |
|---|---|
| L-22 | 2 Hz |
| L-22 3D | |

## L-28 Low distortion, Long-Travel geophone

The L-28 geophone features the highest fidelity available in low-frequency velocity type transducers. The high quality long travel geophone is available either in vertical or horizontal version.

| Natural frequency | |
|---|---|
| L-28 LB | 4.5 Hz |

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