GSO 180 Tip Sparker Source

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The Netherlands

INTRODUCTION

The GSO-180 is one of the smaller members of the latest generation of GSO sparker energy sources. GSO sparkers are based on proven technology. Our sparkers were developed in-house to satisfy the ever changing requirements of clients who continually seek to acquire better quality data sets and more cost effective acquisition.

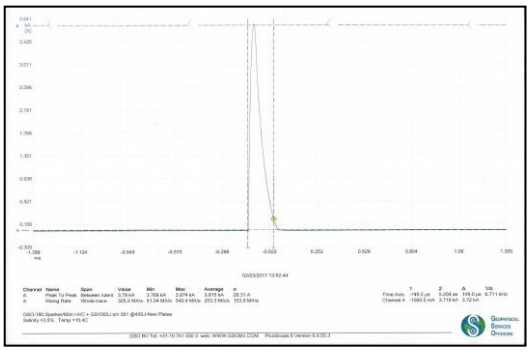
The GSO sparker range is manufactured and built in The Netherlands and currently consists of the following models: GSO-120FW, GSO-180, GSO-360, GSO-540 and GSO-720.

With the GSO-180 sparker you will be able to acquire very high resolution (<30 cm) seismic profiles of the "shallow" sub bottom strata in water depths up to about 300 m.

Complete GSO 180 sparker system with HV tow cable, HV junction box and CSP-N Power Supply.

Depending on the energy level, the geology and water depth, the effective penetration can exceed 50m below seabed. The GSO-180 sparker is a small, versatile and compact unit ideal for use from small vessels. It has proven to be a reliable and low maintenance seismic energy source.

FEATURES



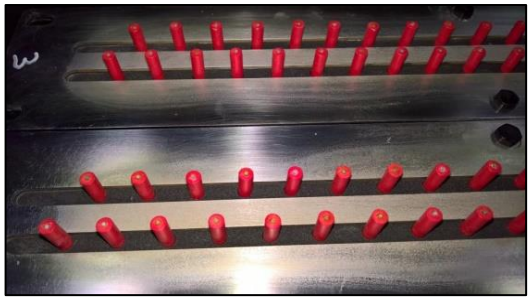
Negative Polarity Mode

The GSO-180 sparker has been designed for operation with any 3rd party negative polarity power supply. This concept consists of using a NEGATIVE electric pulse, instead of a positive electric pulse. Note: working with a negative electric pulse is NOT the same thing as reversing the polarity of a conventional power supply, which still generates a positive pulse

Example of GSO-180 / 400Joules Electrical PulseTtest: note the sharp pulse with an average pulse width of 150 µS

Zero Electrode Wear

By working in negative polarity mode the electrode tip wear is reduced to practically zero. Therefore, once the GSO sparker has been deployed data acquisition can continue without having to retrieve it once or twice a day in order to maintain the tips. Contrary to the standard sparker, the negative polarity makes the GSO sparker an extremely low maintenance source that can save client many hours of non-productive vessel time.



Enhanced Acoustic Repeatability

Zero tip wear is also essential for the long-term repeatability of the acoustic pulse, which depends largely on a constant, unaltered electrode surface.

These GSO electrodes were fired approximately 4,000,000 times (almost continuously) during a project in 2016. Note the absolute minimum wear to the electrode tips.

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User determined Sparker Parameters

The simple design of the GSO-180 sparker provides the user total control of all relevant sparker parameters such as source depth, power output in Joules/tip and geometry. By means of a HV junction box located between the HV tow cable and HV power supply unit the operator is able to change the number of electrode modules in use without having to retrieve the GSO-180. The two individually connected electrode modules of 90 tips each allows the energy from the HV power supply unit to be distributed evenly over 90 or 180 tips.

The GSO-180 sparker viewed from below. Two 90 tip electrode modules housed in a compact sparker frame.

Joules/tip

Power settings on the HV power supply unit can be adjusted in a range from 50 to 1000 Joules at 50 Joule steps. Thus power output can be varied between approximately 1 and 10 Joule/tip.

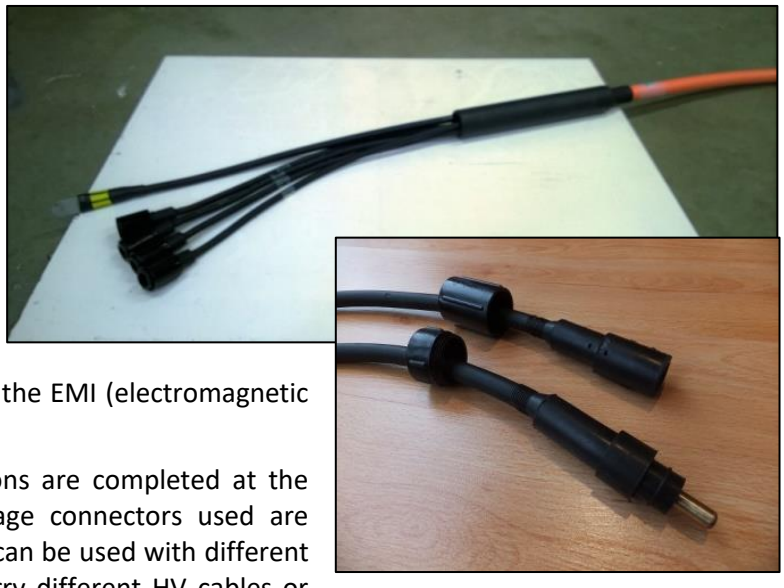
Electrode Configuration

The GSO-180 sparker consists of 2 x 90 tip electrode modules housed in a compact sparker frame.

The electrode modules are evenly spaced in a planar array. This geometry along with design of the GSO electrode modules enhances the downward projection of the acoustic energy. It also reduces the primary pulse length since all tips fire perfectly in phase.

GSO High Voltage Tow Cable

The GSO-180 sparker comes with a standard GSO 60m HV tow cable. Other cable lengths are available upon request. The HV tow cable is specially manufactured for GSO and has a double insulation jacket and an integrated Aramide braid (BS 2000daN). The power is conducted via 24 mm^2 (4x6) cores (class 6) and a 25 mm^2 braiding (ground referenced). It is designed to have a very low self-inductance in order to preserve the dI/dt pulse output of the negative polarity power supplies. The coaxial design of the GSO HV tow cable also minimises the EMI (electromagnetic magnetic interference) effects.



Universal HV connectors

The final cable build and connector terminations are completed at the GSO workshops in Rotterdam. The High voltage connectors used are universal and therefore the same HV tow cable can be used with different GSO sparker systems, negating the need to carry different HV cables or inline adaptors for different sources. On board it takes less than 2 minutes to change out GSO sparkers.

The length of the standard supplied HV cable is 60m, however cables of 40m, 50m or 90m are also available. Other HV tow cable lengths can be built upon request.

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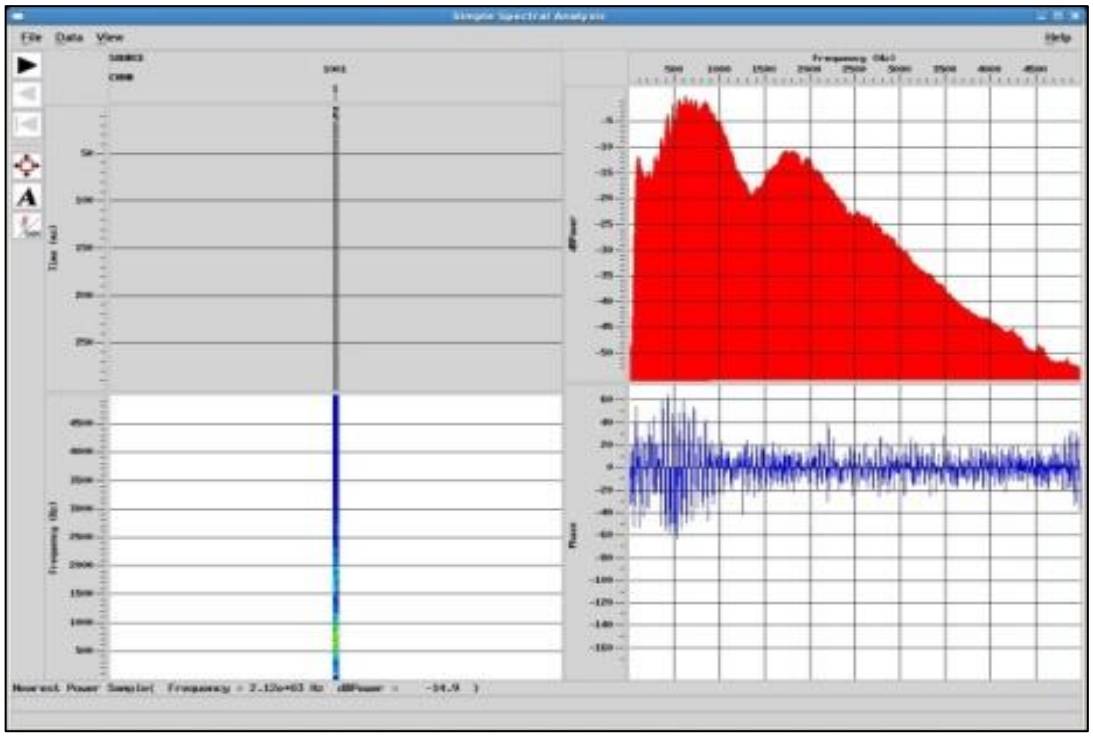
High Voltage Power Supply Units

Typically GSO BV supplies the GSO-180 sparker with a Applied Acoustics CSP-N series power supply unit. However other suitable units are available. The GSO-180 is connected to the PSU via the HV tow cable and HV junction box. The junction box enables the user to connect/disconnect electrode modules without the need to retrieve the GSO-180 sparker.

Additionally, if required a UPS system can be supplied to eliminate possible variations in the mains input power supply. (As shown on top of the Applied Acoustics CSP-N power unit).

Applied Acoustics CSP-N series HV power supply with UPS unit (on top) and connected HV Junction Box (in front).



Example of Spectral Analysis GSO-180 (1000 Joules).

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SPECIFICATIONS

GSO-180 sparker

Design	:	Marine quality stainless steel (316) Electrically pacified c/w aluminium protection anodes
Dimensions	:	L x W x H = 109 x 57 x 43 cm
Overall Weight	:	35.0 kg
Shipping	:	Standard Euro pallet/plastic container 60 x 80 x 120 cm
Array Depth	:	Adjustable from 20 cm to 50 cm below surface
Array Geometry	:	Planar configuration of 57cm x 100cm for enhanced downward projection of acoustic energy
Number of Tips	:	Number of active Electrode Modules (1-2) corresponding to 90, 180 tips
Energy Level	:	Recommended max energy per tip in negative polarity mode:- 5.5 Joule/tip (i.e. 1000 Joules)
Standard Configuration	:	2 x 90 tip electrode modules.
Primary Pulse Length	:	Around 0.250 ms
Dominant Frequencies	:	Between 400 - 1800 Hz, depending on the selected energy level & tips

HV Tow Cable

Design	:	Coaxial HV cable, Aramide braid reinforced, double insulated and LOW EM emission
Tested	:	5600 Volts pulsed (100-200 microseconds)
Material/Colour	:	High quality Polyurethane (HFS 100), orange
Outer Diameter	:	30 mm
Bending Radius	:	400 mm
Weight	:	1.10 kg/m
Inner Cores	:	4x6 mm^2 PU insulated
Outer Braiding	:	1x25 mm^2 PU insulated
Strength Member	:	BS=2.5 tons (2000 daN)
Wet Termination	:	4 x single pin HV connectors, each rated for kV pulses of 5 kA, 1 x ground referenced frame connector
Dry Termination	:	5 eye connectors to HV Junction Box

HV Junction Box

Design	:	Heavy duty, custom-made HMPE distribution box for connection of HV cable to negative polarity power supply, allows connection to each electrode module independently.

HV Power Supply Units

Design(Negative Polarity)	:	The preferred option is an Applied Acoustics unit from the CSP-N series. Other Negative Polarity units can be connected. Specifications are available on request

Also available in the GSO sparker range

GSO-360	:	4 x 90 tip electrode modules.
Dimensions		L x W x H = 109 x 75 x 43 cm
Weight	:	46.5 kg
HV Power Supply	:	100j – 2000j (max 2400j)
GSO-540	:	6 x 90 tip electrode modules.
Dimensions		L x W x H = 109 x 75 x 43 cm
Weight	:	60 kg
HV Power Supply	:	100j – 2400j
GSO-120 FW	:	2 x 60 tip electrode modules for use in fresh water
GSO-720	:	8 x 90 tip electrode modules (available 2018)

Note: Above specifications can be subject to change