

Marine Seismic



Energy sources MultiJack

MultiJack is a unique energy source with the fastest charging rate available on the market designed to supply operations of sparker and boomer sound sources.

- High charge rate
- Flip-flop and code sequences support
- Simultaneous source and multilevel sources support
- High energy level
- Combining units by power
- Intuitive user interface
- Remote control unit available



MultiJack model	500HP1.5	1250HP1.5	2500HP3.0	5000HP6.0	10000HP12	25000HP12	50000HP12
Maximum pulse voltage, kV	4 (6 optionally)						
Type of charger	pulse charger						
Trigger mode	external/repetitive/manual						
Operating energy, J	50 ÷ 500	50 ÷ 1250	50 ÷ 2500	50 ÷ 5000	50 ÷ 10000	50 ÷ 25000	50 ÷ 50000
Charging rate, J/s	1500		3000	6000	12000		
Power mains	110 or 220 V, 50 Hz			380 V, 50 Hz			
Maximum power consumption, kW	1/2/3		1/2/3/4/5/6	12	12/24		
Overall dimensions, cm	54x41x27		58x56x50	58x59x69	depends of customization		
Weight, kg	20	26	74	99	depends of customization		

Electrodynamic source G-Boomer

G-Boomer is a very high-resolution marine seismic source designed for detailed stratigraphic studies and geological mapping in relatively shallow depths.

- UHR seismic source
- High repeatable broadband signal
- Vertical resolution up to 10 cm
- Compact and lightweight
- Stainless steel frame
- GNSS receiver option



	G-Boomer	2G-Boomer	4G-Boomer	G-Boomer HF
Plates	1	2	4	1
Maximum pulse energy, J	300	600	1200	300
Recommended pulse energy, J	50 ÷ 250	100 ÷ 500	200 ÷ 1 000	50 ÷ 250 J
Maximum input power, J/s	600	1200	2400	600
Typically source level re 1µPa at 1 metre	215 dB at 250 J	220 dB at 500 J	225 dB at 1000 J	215 dB at 250 J
Pulse spatial length, ms*		0.75 ÷ 1.5		0.2 ÷ 0.4
Frequency range, Hz*		100 ÷ 6 000		100 ÷ 10 000
Recommended MultiJack	500HP1.5	500HP1.5	2500HP3.0	500HP1.5
Recommended coaxial HV cable	1x10	1x20	1x50	1x10
Plate size / weight	380x380x100 mm / 15 kg			

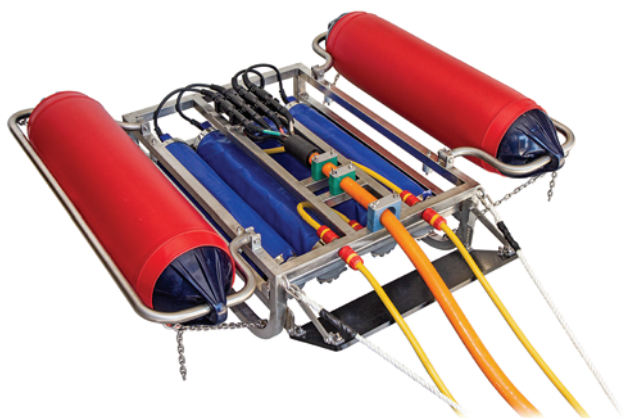
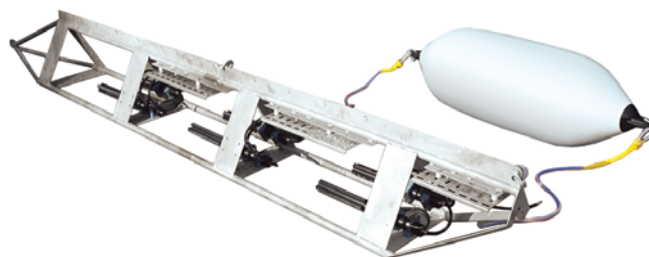
*depending on energy setting of MultiJack

Sparkers

Sparker is a marine seismic source, that generates acoustic signal by discharging an electrical pulse. Typically, sparkers are used in marine seismic acquisitions in seas and oceans, as salt water is a good current conductor.

Salt Water Sparkers (SWS) of various configurations are available for these purposes. Fresh Water Sparkers (FWS) are a series of sparkers, which are specifically designed to work in fresh waters due to special containers with embedded multi-tip groups. Deep Water Sparkers (DWS) series are developed to ensure operations that are distant from the surface and perfectly suited for deep-towed marine surveys and VSP.

- Suitable for any type of HR/UHR surveys
- High-repeatable broadband signal
- Long-life and durable electrodes
- Replaceable electrode groups
- Adjustable tow depth
- Multi-level capability
- Stainless steel frame
- GNSS receiver option



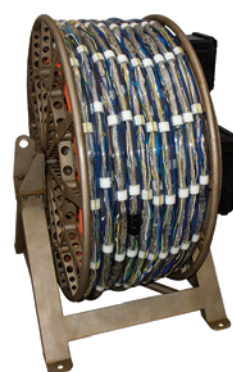
Type	Model	Max energy	Levels	Max J at level	Tips at level	Groups at level	Recommended MultiJack	Recommended coaxial HV cable
Freshwater	FWS-125	1250	1	1250	126	2	1250HP1.5	2x10
	FWS-250	2500	1	2500	252	4	2500HP3.0	4x12.5
	FWS-500	5000	1	5000	504	4	5000HP6.0	4x12.5
Conventional marine	SWS-125	1250	1	1250	126	2	1250HP1.5	2x10
	SWS-250	2500	1	2500	252	4	2500HP3.0	4x12.5
	SWS-500	5000	1	5000	504	4	5000HP6.0	4x12.5
	SWS-1000	10000	1	10000	1008	4	10000HP12	4x12.5
	SWS-2500	25000	1	25000	2520	6	25000HP12	6x16.7
Dual-level marine sparkers	2xSWS-250	5000	2	2500	252	2	2x2500HP3.0	4x12.5
	2xSWS-500	10000	2	5000	504	4	10000HP12 or 2x5000HP6.0	2x(4x12.5)
	2xSWS-1000	20000	2	10000	1008	4	25000HP12 or 2x10000HP12	2x(4x12.5)
Triple-level marine sparkers	2xSWS-2500	50000	2	25000	2520	6	50000HP12 or 2x25000HP12	6x50
	3xSWS-250	7500	3	2500	252	2	3x2500HP3.0	6x16.7
	3xSWS-500	15000	3	5000	504	2	3x5000HP6.0	6x16.7
Triple-level marine sparkers	3xSWS-1000	30000	3	10000	1008	2	3x10000HP12	6x50
	3xSWS-2500	75000	3	25000	2520	2	3x25000HP12	6x50

Towed hydrophone array HRStreamer

HRStreamer is a range of high sensitive single and multichannel marine towed streamers, specifically designed for high resolution and ultra-high resolution engineering marine seismic applications.

Single channel HRStreamer-1 is a towed hydrophone streamers with adjustable group length. Long groups can hardly be used for shallow water acquisitions due to their directivity pattern, which results in filtering out high frequency energy. We were able to overcome this issue by placing up to 4 groups with variable length, making the HRStreamer a universal solution for acquisitions in wide water depth ranges. Combining all groups together results in an equivalent single group length that is able to increase the single-to-noise ratio.

Multichannel HRStreamer-24 and HRStreamer-48 are easy-to-operate hydrophone arrays with up to 48 channels. Various group intervals are available for manufacture, such as standard spacings of 1 m, 2 m, 3.125 m, 6.25 m or popular these days combination of mixed hydrophone spacing in one streamer. Mixed hydrophone spacing of 1 and 2 m provides good trade-off between streamer length and trace density in the upper part of the section



- Suitable for any type of HR/UHR surveys
- Supports optimal towing depth, slanted cable and deep tow acquisitions
- AVO friendly
- Groups or single receivers
- Low-noise preamps
- High-sensitive acceleration-insensitive hydrophones
- Optional pressure sensors
- Eco-friendly and safe filler

Cable system	
Type	linear with preamplifiers
Number of channels	1 ÷ 48
Interval between channels	as agreed
End connector type	as agreed
External diameter	from 32 mm
Piezoelectric element	
Operating frequency band	10 ÷ 10 000 Hz
Sensitivity	180 μ V/Pa
Capacity	4000 pF
Maximum working pressure	40 Bar
Sensitivity to accelerations	acceleration-insensitive

Preamplifier	
Type	low-noise dissymmetric
Gain	6 dB
Current consumption per channel	10 mA
Output resistance	395 Ohm
Power supply voltage	\pm 12 V, bipolar
Maximum output level	\pm 3.8 V
RMS voltage of the intrinsic electrical noise, given by output, in the operating frequency band	less than 10 μ V
Usage conditions	
Operating temperature range	-10 ÷ +70 $^{\circ}$ C
Storage temperature range	-40 ÷ +70 $^{\circ}$ C

Deck winches and reels

Deck winches (DW) and reels (DR) for high-voltage cable line of a source (sparker or boomer) and towed hydrophone streamers are designed for temporary or stationary setup on seismic acquisition vessels in order to provide hoisting operations and towing seismic sources and streamers during geophysical surveys.



- Manual or electric drive
- Slip ring
- IP-67 protection
- Integrated patch panel
- Stainless steel frame and drum
- level winder available

	DW-250	DW-300	DW-600	DW-800	DR-150
Materials	stainless steel and polymer				
Drum pitch diameter, mm	500		800		600
Drum outer diameter, mm	1 000	1 200		1 400	940
Drum width, mm	400	450	600	800	400
Drive	electric gear motor				hand-operated
Motor power, W		1 100			–
Power mains		220 V or 380 V, AC 50-60 Hz			–
Line speed, m/min		0÷20			–
Weight without cable, kg	200	250	300	350	100
Dimensions, mm	1100 x 985 x 980	1200x1270x1125	1440x1470x1330	1440x1470x1620	1000x600x970

Towed and deck coaxial HV power cables

Series of dedicated cables are designed to ensure efficient transmission of high-voltage pulses from our MultiJack energy source to any type of boomers or sparkers.



- Coaxial structure
- Kevlar reinforced
- Exceptional flexibility
- Stainless steel Kellems grip

Cable	1x10	1x20	2x10	1x50	4x11	4x12.5	1x100	6x16.7	6x50
Shield, mm ²	10	20	20	50	44	50	100	100	300
Quantity of cores	1	1	2	1	4	4	1	6	6
Core, mm ²	10	20	10	50	11	12.5	10	16.7	50
Breaking force, kN	3	5	10	30	50	50	50	50	50

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- Magnetic
- Gamma radiation detection

