

## B-GA S HP™ Gradient Series

- Maximum Gradient and Shim Performance in Animal MRI

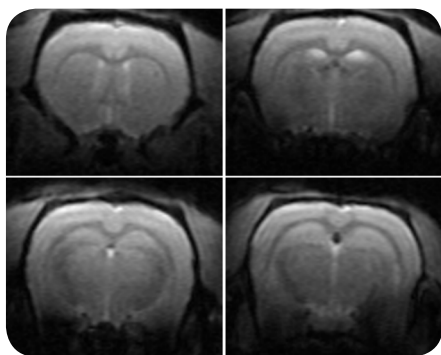
The Bruker gradient series B-GA S HP delivers unsurpassed performance for the whole range of animal MRI applications. The unique design provides highest gradient strengths and slew rates required for high field animal imaging. The high cooling efficiency results in leading duty performance and as a consequence of it, modern imaging sequences with minimum field of view and a high number of slices for long experiment times can easily be performed. The integrated shim coils add up to ultra-strong shim capabilities. The B-GA S HP gradients can be operated as inserts and are easily exchangeable for maximum flexibility.

### Superior performance featuring:

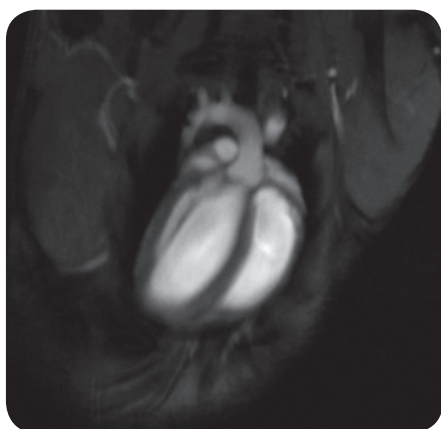
- Highest gradient strengths up to 1000 mT/m
- Highest slew rates
- Unsurpassed duty cycle specifications
- Very high gradient linearity
- Optimal gradient shielding
- Maximum shim performance

### Slew Rate

The B-GA S HP gradient series offers outstanding slew rate performance. For instance, the B-GA12S HP is ramping up to 660 mT/m within 130  $\mu$ s. Only these very short ramp times allow to run the latest fast imaging techniques such as single and multi shot echo planar imaging (EPI) using large matrix sizes. These techniques deliver high resolution functional MR imaging applications on small objects such rats and mice.



High resolution ( $195\mu\text{m}^2$ ), 5 slices single shot EPI acquired in 360 ms. High image quality and high temporal resolution enable the most challenging applications like BOLD fMRI.



Rat heart in vivo: Image of cardiac cine with high spatial and temporal resolution

## Duty Cycle

The gradient duty cycle is one of the key specifications for high end MRI instruments. It determines the gradient strength and on time that can be performed without overheating the gradient subsystem. A high duty cycle is mainly the result of an efficient heat extraction which is achieved by an excellent water cooling system combined with the application of latest molding materials as used in the Bruker HP gradient series that unite best thermal conductivity with the required mechanical properties.

Gradients with high duty cycle specifications allow the execution of demanding state-of-the-art MRI experiments with e.g. very short TR and TE times, large number of slices as required for diffusion imaging or cardiac imaging studies, fMRI experiments, MR angiography etc.

The duty cycle is typically defined by the total maximum DC gradient strength that can be output continuously by all three gradient channels simultaneously without overheating the gradient system. For the Bruker B-GA12S HP gradient coil this maximum gradient strength is 330 mT/m, beside a powerful 660 mT/m peak gradient strength per channel and best in class slew rates.

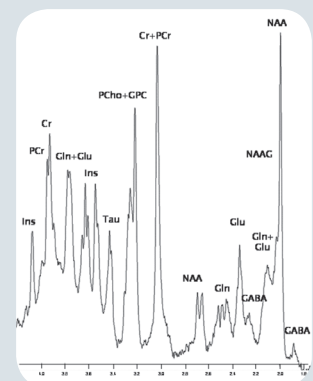
## B-GA S HP : Available for all Bruker MRI Systems



The B-GA S HP high performance gradient systems take advantage of Bruker's Streamline Technology.



$29\mu\text{m}^2$  in-plane resolution of mouse cerebellum measured at 9.4 T. Identification of anatomical structures like white matter, granular layers, molecular layers and Purkinje cell layers is possible.



Rat brain spectrum acquired at very high field of 9.4 T showing the excellent spectral resolution achieved *in vivo* with the B-GA12S HP gradient system.

Product	B-GA6S - 100	B-GA9S HP	B-GA105S HP	B-GA12S HP	B-GA20S HP
Used as main coil in	11 cm magnets	16 cm magnets	18 cm magnets	20 cm magnets	30 cm magnets
Usage as insert for	B-GA12S HP/ B-GA20S HP	B-GA20S HP	No	B-GA20S HP	No
Inner diameter [mm]	60	90	105	114	200
Outer diameter [mm]	102	152	169	198	303
Largest available diameter for animals [mm]*	35	72	82	86	154
Max. gradient strength [mT/m]	1000	760	900	660	300
Max. linear slew rate [T/m/s]	9000	6840	4200	4570	1040
Total max. DC gradient strength, simultaneous all channels [mT/m]	445	300	335	330	115
Max number of shim channels Z0**+Linear+2nd order+3rd order+4th order***	1+3+5+7	1+3+5+1+1	digital+3+5+1	1+3+5+1+1	1+3+5+1+1

\* Inner diameter of the largest RF coil in the standard coil portfolio

\*\* In the standard configuration Z0 is replaced by real-time frequency correction

\*\*\* The number of useable channels is depending on the shim power amplifier

## ● Bruker BioSpin

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