



## NMR

# Ascend Evo 1.0 GHz NMR

## Novel Single-Story Compact NMR with Reduced Helium Consumption

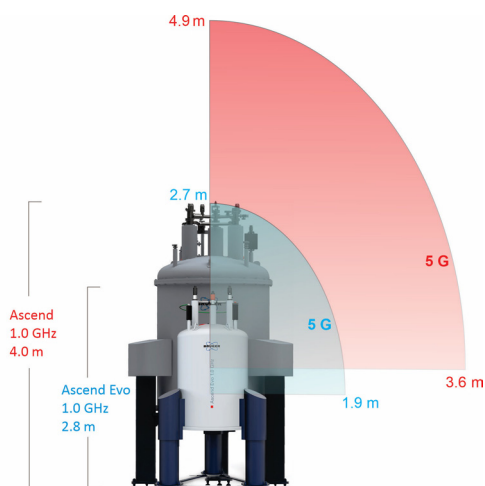
*Innovation with Integrity*

The Ascend Evo 1.0 GHz NMR system offers a unique compact magnet that significantly reduces footprint, weight, and ceiling height requirements, as well as provides a dramatic threefold reduction in liquid helium consumption. This novel and unique design also significantly reduces siting, installation, and operational costs making it more accessible to more labs.

The cutting-edge technology featured in the Ascend Evo 1.0 GHz is the result of extensive experience with ultra-high field NMR systems. Most NMR magnets are built from low-temperature superconductors (LTS). At an operating temperature of 4.2 K, NMR magnets up to approximately 800 MHz can be built from LTS. If the operating temperature is lowered to approximately 2 K, up to 1.0 GHz can be achieved. Higher fields cannot be reached with LTS, due to limitations in the conductors' critical field. For higher field magnets, e.g. for Bruker's 1.1 GHz and 1.2 GHz NMR magnets, high-temperature superconductors (HTS) must be used.

The development of the new Ascend Evo 1.0 GHz compact magnet was made possible by overcoming numerous challenges associated with using HTS for NMR magnets. This was combined with the experience gained from manufacturing and installing such magnets at customer sites, resulting in a coil that operates at the standard 4.2 K temperature.





### Minimizing Siting Costs:

- Fits in a standard single-story lab with a minimum ceiling height of only 3.25 m or just over 10.5 ft
- Weighs less than a third of the previous 1.0 GHz magnets
- Significantly reduces stray fields with the 5 G enclosed volume being 15 % of previous magnets
- Requires less than a third of the lab footprint for the complete NMR system when compared to previous 1.0 GHz magnets
- Does not require a pump control cabinet, sub-cooling pumps, or pump lines
- Does not require a platform around the magnet for operation

### Minimizing Installation and Operating Costs:

- Requires less than 30 % of the liquid helium start-up volume for installation, compared to the previous 1.0 GHz magnets
- Reduces operational costs by more than 70 % with a significantly smaller He boil-off
- Eliminates the need for regular LN<sub>2</sub> refills through 100 % N<sub>2</sub> re-liquefaction

	Ascend 1.0 GHz	Ascend Evo 1.0 GHz
<b>Dimensions (W x H)</b>	1.7 m x 4.03 m	1.1 m x 2.84 m
<b>Min. Ceiling Height</b>	4.9 m (2-story lab)	3.25 m (single-story lab)
<b>Total weight</b>	8400 kg	2300 kg
<b>5 Gauss Stray Field</b>	3.6 m radial x 4.9 m axial	1.9 m radial x 2.7 m axial
<b>He boil-off</b>	< 250 ml/hr	< 80 ml/hr
<b>He hold-time</b>	60 days	> 130 days
<b>Operating temperature</b>	2 K, sub-cooled	4.2 K, standard

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