

1000MHz 7.0mm single channel MAS probe
USER MANUAL

Bruker BioSpin

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CAUTION!

Probe must be operated only inside the magnet.

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Table of Contents

1.	Introduction	3
2.	Specifications.....	4
2.1.	RF specifications	4
2.2.	Variable Temperature (VT) specifications	4
2.3.	Magic Angle Spinning (MAS) specifications.....	4
3.	Probe interfaces	5
4.	Tuning the probe	6
4.1	Inserts	6
4.2	Removing the shield	7
4.3	Locations of the inserts	8
4.4	Exchanging inserts	9
5.	Probe tuning table	10

1. Introduction

This is a single channel Magic Angle Spinning (MAS) probe designed for solid-state NMR applications. The X channel can be tuned to the specified nuclei that have Larmor frequencies between ^{17}O and ^{103}Rh .



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2. Specifications

2.1. RF specifications

Maximum RF fields and maximum pulse durations.

Channel	Tuning range	Maximum field (kHz)	Maximum duration (μ s)
X	$^{103}\text{Rh} - ^{17}\text{O}$	10 (^{103}Rh) - 40 (^{17}O)	25

Table: 1

2.2. Variable Temperature (VT) specifications

Interface: Direct Variable Temperature (DVT)
 VT range: -50°C to +80°C

2.3. Magic Angle Spinning (MAS) specifications

Rotor diameter (mm)	Maximum spin rate (kHz)
7.0	8

Table: 2

3. Probe interfaces

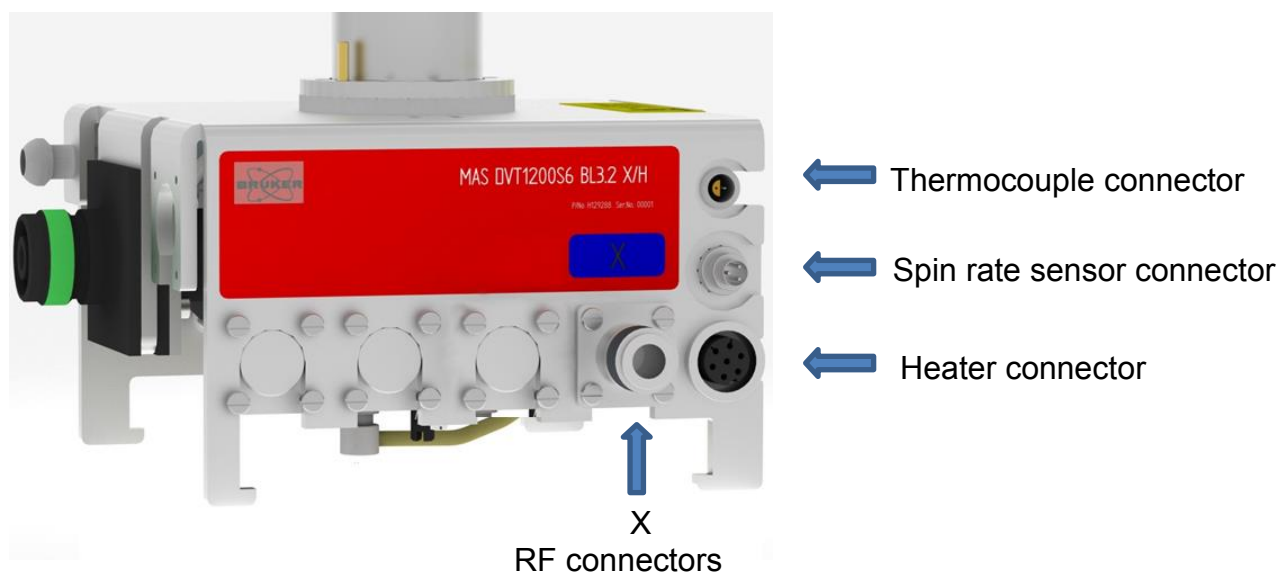


Figure: 1

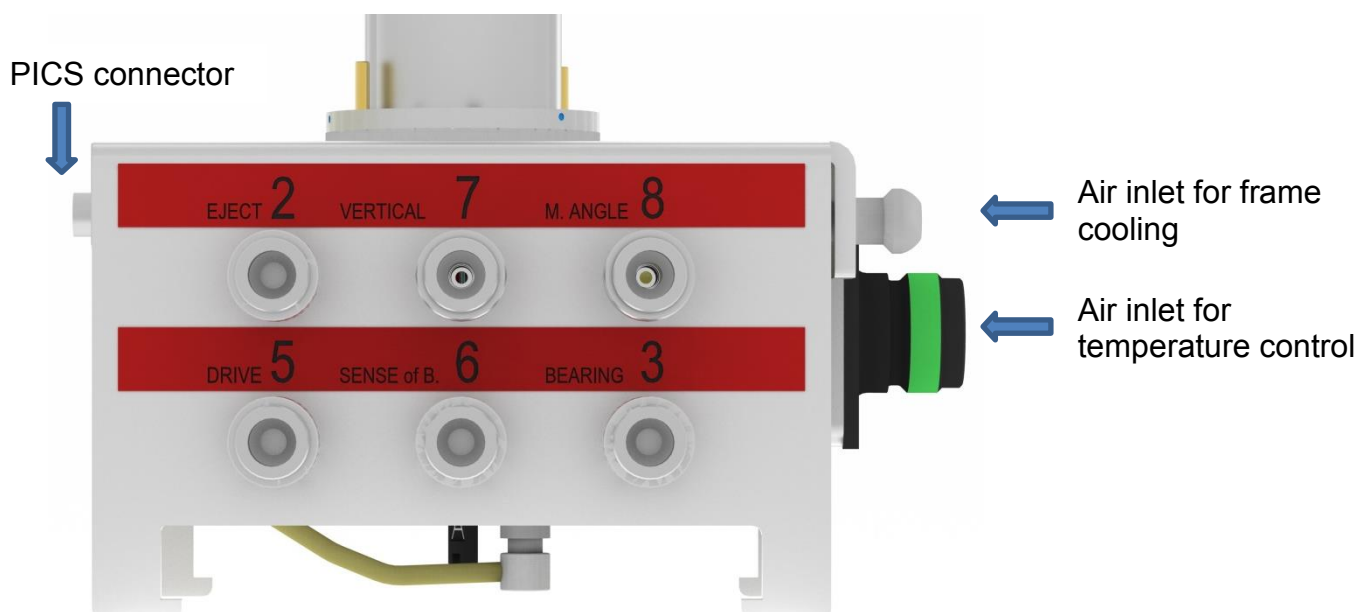


Figure: 2

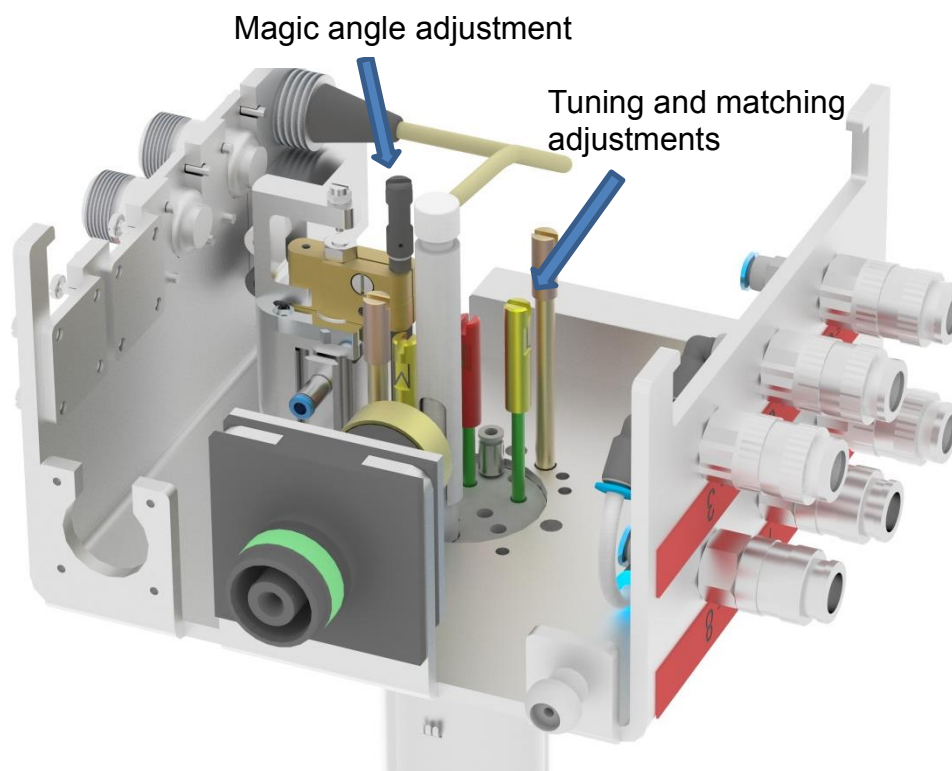


Figure: 3

4. Tuning the probe

The first step is to select the appropriate inserts from the “R.F. Insert kit” by consulting the provided table located at the end of this manual. A dash (-) in the table indicates that the corresponding port does not require an insert, and as such must be left vacant. Once the inserts have been connected, the probe can be tuned and matched to the desired frequencies by adjusting the tuning and matching knobs located at the bottom of the probe.

4.1 Inserts

The basic construction of provided inserts is shown in figure 4. Inserts without a label are referred to by the value printed on the capacitor as shown in figure 4. All inserts are delicate and must be handled with care.



Figure: 4

4.2 Removing the shield

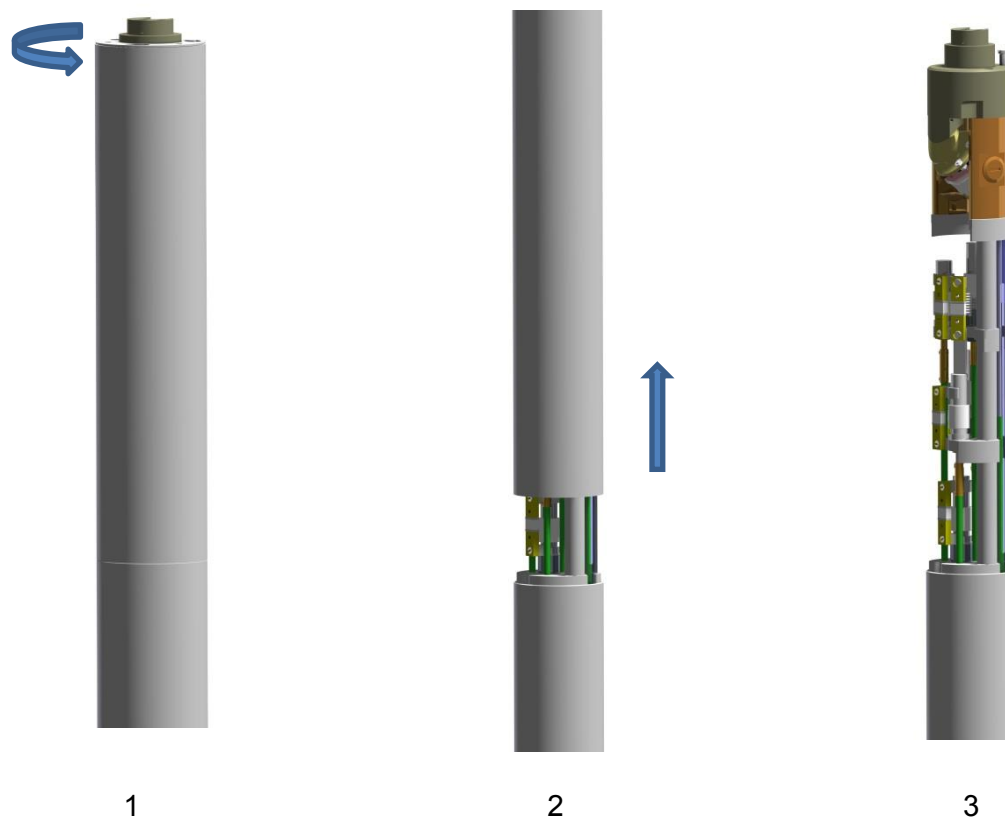


Figure: 5

1. Rotate the top part of the shield, from left to right to unlock the shield (Figure 5).
2. Slide the shield up without rotating.
3. Remove the top part of the shield completely to access the inserts.

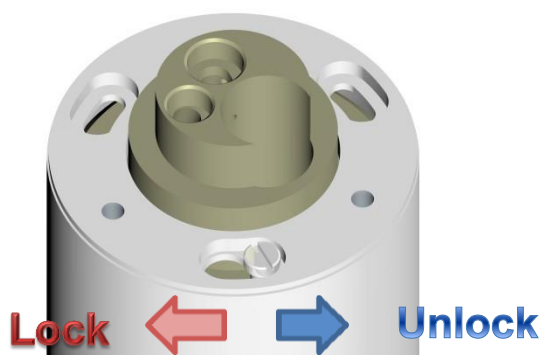


Figure: 6

4.3 Locations of the inserts

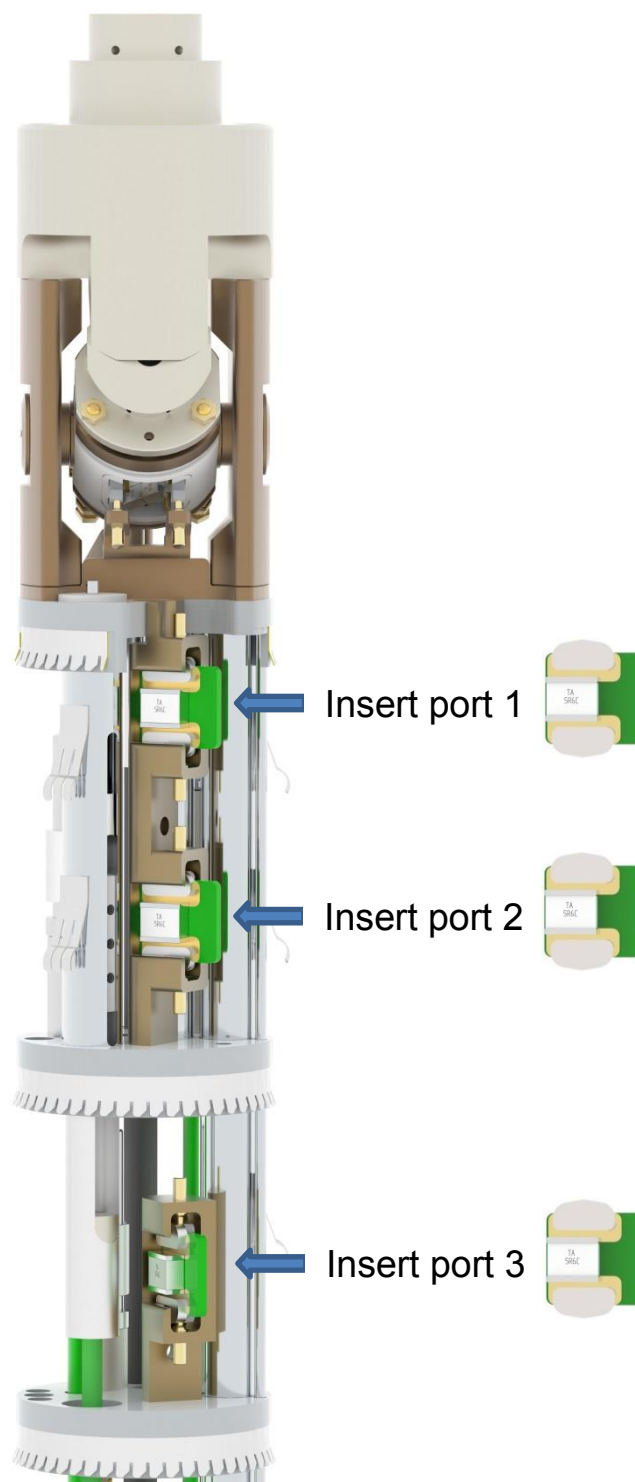


Figure: 7

4.4 Exchanging inserts

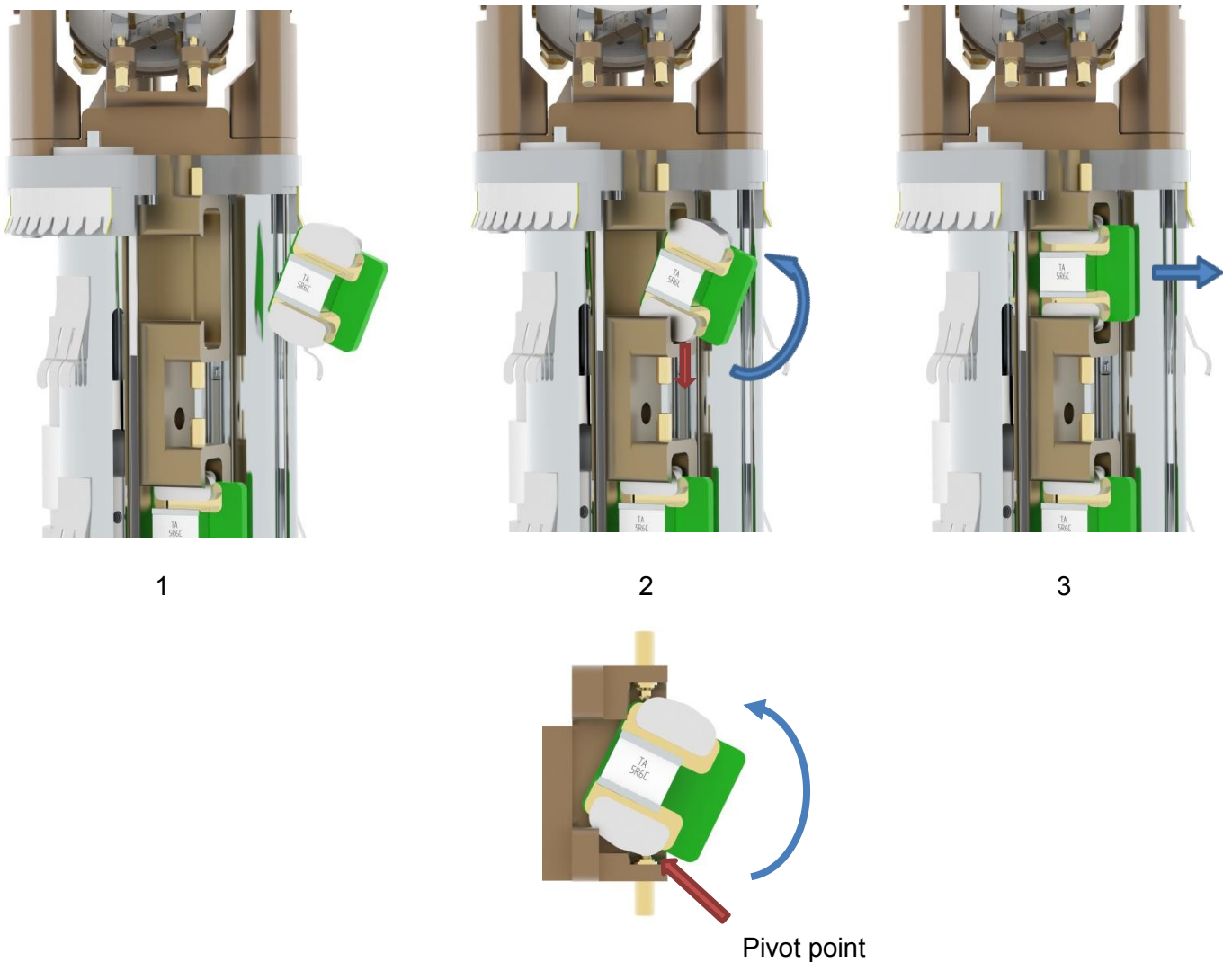



Figure: 8

 Do not push inserts directly into the insert base.

1. Hold the insert at angle as shown in figure 8–1.
2. Rotate the insert while firmly pushing down on the bottom spring loaded contact located in the insert ports, as shown in figures 8–2 and 8-2A.
3. The insert can be removed by directly pulling on the insert.

5. Probe tuning table

X nucleus	Insert 1	Insert 2
¹⁷ O	Coil	-
¹³⁸ La		
¹³³ Cs		
¹²³ Sb		
¹⁸¹ Ta		
¹⁷⁵ Lu	-	-
¹³⁷ Ba		
¹⁵³ Eu		
¹⁰ B		
¹⁵ N		
⁵⁰ V		
¹³⁵ Ba		
³⁵ Cl		
⁸⁵ Rb		
⁹¹ Zr		
⁶¹ Ni	7R5	-
¹⁶⁹ Tm		
¹³¹ Xe		
³⁷ Cl		
¹⁷⁶ Lu		
²¹ Ne		
¹⁸⁹ Os	150	-
³³ S		
¹⁴ N		
⁴³ Ca		
⁹⁷ Mo		
²⁰¹ Hg		
⁹⁵ Mo	-	
⁶⁷ Zn		
²⁵ Mg		

X nucleus	Insert 1	Insert 2
⁵³ Cr	150	7R5
⁴⁹ Ti		
⁴⁷ Ti		
¹⁴³ Nd		
¹⁰¹ Ru	330	-
⁸⁹ Y		
¹⁷³ Yb		
¹⁵⁷ Gd	390	-
³⁹ K		
¹⁰⁹ Ag		
¹⁶³ Dy		
¹⁰⁵ Pd	390	7R5
⁸⁷ Sr		
¹⁸³ W	390	150
¹⁴⁷ Sm		
¹⁰⁷ Ag		
⁸³ Kr	330	270
¹⁵⁵ Gd	390	270
⁷³ Ge	680	7R5
⁹⁹ Ru	680	150
¹⁴⁵ Nd	680	200
¹⁶¹ Dy		
¹⁴⁹ Sm		
⁵⁷ Fe	680	270
¹⁰³ Rh	680	330

Table: 3