

Customer Information

Customer Name	Sai Sankar Gupta, K.B.
Operator Name	Sai Sankar Gupta, K.B.
Company	University of Leiden
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Bruker Information

Office	GSEC
Engineer	Alban GARCIN
Central Hotline Phone	+31 (0) 88 11 22 700
Central Hotline E-Mail	Service.bbio.benelux@bruker.com

Probe Information

Order No.	
Contract No.	
Description	PI HRMAS-750-W4/S7-H/P/C/D-4.0-Z
P/N	Z180004
S/N	0001

Installation Summary

I, an authorized customer representative, acknowledge that the above referenced probe was installed and demonstrated to operate in accordance with the specifications mutually agreed upon by both parties. We accept the delivery and installation of this probe as specified in the purchase order and release Bruker from any further obligation, other than those obligations as specified during the warranty period. If the contract requires a formal acceptance protocol this document serves as such.

Warranty

The warranty period commences according to the contractual agreement.

Place	2333 AL Leiden, Netherlands	Place	2333 AL Leiden, Netherlands
Date	August 10, 2023	Date	August 10, 2023

Sai Sankar Gupta, K.B.
Customer representative signature

Alban GARCIN
Bruker representative signature

Spectrometer Information

Order No.	442759
System	Avance Neo 750
Location	FW.0.01
TopSpin Version	TopSpin 4.3.0 - Build local

NMR Probe

Description	Probe ID	Inspection Lot	Status
PI HRMAS-750-W4/S7-H/P/C/D-4.0-Z	Z180004_0001	2023-08-09	pass

Copies of all spectra (default and additional) are included in customer's PDF report.

Installation Checklist

Installation	pass	fail	n/a	Optional Components	pass	fail	n/a
All firmware	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample Changer	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cortab for required nuclei	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MAS controller	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lift / spin calibration	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	High power equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Customer Training	pass	fail	n/a	LC-NMR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Basic safety	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Liquid Handler SamplePro Tube	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Handling of cryogenic liquids	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Micro-Imaging	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Troubleshooting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Diffusion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Backup (nmr_save, Images)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CryoProbe / Cryoplatfrom	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Introduction to IconNMR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	BNL / BSNL	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Assure-SST / Performance check	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Additional cooling/heating units (like BCU1 / BCU2)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CryoProbe	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	LT-MAS (Low Temperature MAS equipment)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Handling / cleaning of probe	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Gyrotron magnet and DNP console	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
He cylinder exchange	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
He compressor cooling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
RF heating / power limits	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
RF routing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
Acceptance and Warranty	pass	fail	n/a				
Explanation of warranty	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Customer support hotlines	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

General Test Information

Summary of Inspection Lot

Description	Probe ID	Inspection Lot
PI HRMAS-750-W4/S7-H/P/C/D-4.0-Z	Z180004_0001	2023-08-09

Experiments Measured

Sample	Experiment	Status
Z142220	1H lineshape with magic angle spinning (NPT_1H_HRMAS_lineshape)	pass
Z142222	Watersuppression (NPT_1H_HRMAS_watersuppression)	pass
Z142223	P90 1H pulse calibration (NPT_1H_p90determinationf1_1h)	pass
Z142221	1H sensitivity (NPT_1H_sensitivity)	pass
Z142223	Indirect P90 13C pulse calibration (NPT_1H_p90determinationf2_13c)	pass
Z142224	13C sensitivity (NPT_13C_sensitivity)	pass
Z142226	P90 31P pulse calibration (NPT_31P_p90determinationf1_31p)	pass
Z142226	31P sensitivity (NPT_31P_sensitivity)	pass
Z142226	31P sensitivity with 1H decoupling (NPT_31P_sensitivity_dec1h)	pass
Z142223	P90 2H pulse calibration (NPT_prep_p90det_d)	pass
Z142222	1H Z-gradient profile [-] (NPT_1H_gradientprofile_neg)	pass
Z142222	1H Z-gradient profile [+] (NPT_1H_gradientprofile_pos)	pass
Z151220	P90 79Br pulse calibration, HRMAS (NPT_79Br_HRMAS_p90det_79br)	pass
Z151220	Magic Angle setting, HRMAS (NPT_79Br_HRMAS_magicAngle)	pass
Z151220	Maximum spin rate testing, HRMAS (NPT_79Br_HRMAS_maxSpinRate)	pass

Achieved Specifications

Pulse Width

Nucleus	Sample		90° Pulse		Power Limit [W]	Method	Status
			Duration [μs]	Power [W]			
¹ H	Z142223	spec.	8.0	-	100	direct	pass
		ach.	7.8	13.7			
¹³ C	Z142223	spec.	9.0	-	200	indirect	pass
		ach.	8.8	81.4			
² H	Z142223	spec.	90.0	-	27	direct	pass
		ach.	87.9	2.8			
³¹ P	Z142226	spec.	10.0	-	300	direct	pass
		ach.	10.0	52.2			
⁷⁹ Br	Z151220	spec.	-	-	200	direct	pass
		ach.	10.0	108.0			

Sensitivity

Nucleus	Sample		S/N	Remarks	Status
¹ H	Z142221	spec.	-	noise: 2 ppm variable, method: sino best	pass
		ach.	260.4		
¹ H	Z142221	spec.	110.0	noise: 200 Hz variable, method: sino best	pass
		ach.	309.8		
¹³ C	Z142224	spec.	35.0	noise: 40 ppm variable, method: sino best	pass
		ach.	76.4		
³¹ P	Z142226	spec.	30.0	noise: 5 ppm variable, method: sino best	pass
		ach.	74.2		
³¹ P	Z142226	spec.	-	noise: 5 ppm variable, method: sino best, with ¹ H decoupling during acquisition	pass
		ach.	94.1		

Lineshape without Rotation

Nucleus	Sample		50% [Hz]	0.55% [Hz]	0.11% [Hz]	Status
¹ H	Z142220	spec.	1.00	12.0	18.0	pass
		ach.	0.79	6.8	11.6	

Water Suppression

Nucleus	Sample		Splitting [%]	10% [Hz]	50% [Hz]	S/N	Flow [l/h]	Status
¹ H	Z142222	spec.	-	-	-	-	n/a	pass
		ach.	22	29.1	16.4	45.1		

Samples used for Inspection Lot

Sample	Description
Z142220	1% Chloroform (CHCl ₃) in Acetone-D ₆ (50 µl)
Z142221	0.1% Ethylbenzene (EB) in Chloroform-D (50 µl)
Z142222	2 mM Sucrose, 0.5 mM DSS, 2 mM NaN ₃ in 90% H ₂ O + 10% D ₂ O (50 µl)
Z142223	100 mM Urea- ¹⁵ N ([¹⁵ NH ₂] ₂ CO), 100 mM Methanol- ¹³ C (¹³ CH ₃ OH) in Dimethyl Sulfoxide-D ₆ (50 µl)
Z142224	40% Dioxane in Benzene-D ₆ (ASTM, 50 µl)
Z142226	0.0485 M Triphenyl Phosphate (TPP, [C ₆ H ₅] ₃ PO ₄) in Acetone-D ₆ (50 µl)
Z151220	Potassium Bromide (KBr, 80 µl)

Remarks / Exclusions

Don't Forget to put SB Shimcoil and change WB-BST with SB-BST in the magnet. Load the right shim matrix in BSMS shim configuration.

Don't forget to activate preamplifier in BSMS gradient control.

EDTE gas flow configuration must be adjusted in 'external'

Bearing goes through the cooling unit.

We can see some vibrations on the lineshape around 50Hz, 161Hz to 177Hz even with bumpers up.

Topspin updated at 4.3.0