

PHOENIX NMR

Elevating your science

NB 1200MHz HFX 1.2mm MAS Probe

Probe Switch = 18
(ID)

PN: PH1FT1S2NN

Tender Ref: CJ-03-23-PHYSICS-MASNMR-SB

Description

A 4 channel magic angle spinning probe for solid state NMR applications. The unique modular probe head design increases versatility by allowing easy exchange of different module sizes by the user, while utilizing the same probe base. The use of transmission line tuning efficiently transmits high power RF pulses to the sample with minimal probe ring-down over a wide tuning range. The H/F channel allows for optimized operation of ^1H or ^{19}F as well as simultaneous ^1H and ^{19}F . VT operation through the probe minimizes loss while eliminating the need to purchase additional hardware.

Tuning Range

Quadruple Resonance Mode: **H:** ^1H and ^{19}F **X:** 31P to 13C **Y:** ^{23}Na to 15N

Triple Resonance Mode: **H:** ^1H and ^{19}F **X:** 31P to 15N

Tuning on X can be lowered to $\sim 15\text{MHz}$ with optional Low Gamma box.

Spinning Module

Material: PCTFE
The PCTFE module exhibits reduced ^1H background. ^{13}C background is improved when performing cross polarization experiments, however ^{19}F is relatively strong.

Spin Rate: 10kHz-60kHz
Stability: +/- 30Hz or +/- 0.1%, whichever is larger, over 24hrs at +/-50C
Sample Volume: 1uL Active sample volume used for all NMR tests
VT Range: -30C to +50C with FTS pre-conditioner or LN2

Resolution

Adamantane (^{13}C): 0.05ppm FWHM, 0.12ppm @ 10%, 0.24ppm @ 2%

Signal to Noise¹: HFCN 68:1 HFC 86:1

Target RF Performance:

Nucleus	pw90(μs) 500W amp
$^1\text{H}/^{19}\text{F}^2$	2.1
^1H & $^{19}\text{F}^3$	3.1
31P	2.9
^{13}C	2.9
15N	5.0

¹ Expected S/N on Agilent/Varian VNMRS system. Measured with Glycine, spinning at 10kHz, optimized variable amplitude CP and contact time, matched line broadening, and 32 scans.

² PW spec for H or F pulses

³ PW spec for H & F simultaneous pulses

H Max pulse length, duty cycle; 50ms, 3%

X Max pules length, duty cycle; 15ms, 3%



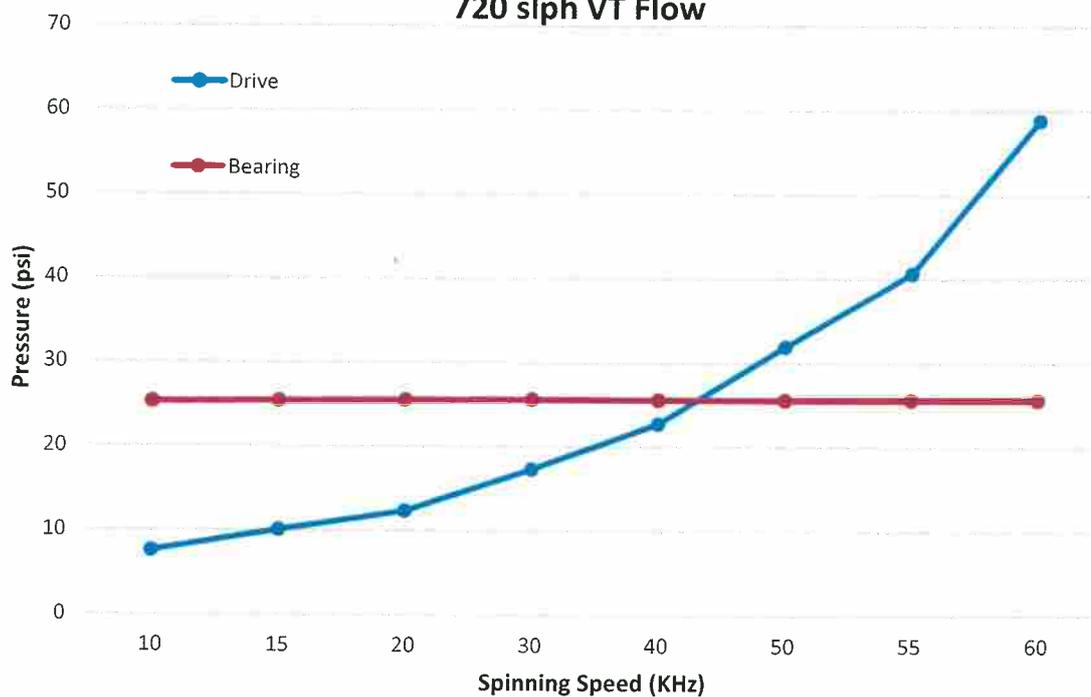
Customer University of Warwick
Serial Number SN240504
Frequency 1200MHz
Style HFXY
Field Center 701mm

Module Size 1.2mm
Module Material PCTFE
Min Speed 10kHz
Max Speed 60kHz

Spin Speed (kHz)	Bearing Pressure (psi)	Drive Pressure (psi)
10	25.3	7.6
15	25.4	10.1
20	25.5	12.3
30	25.6	17.3
40	25.6	22.7
50	25.6	31.9
55	25.6	40.6
60	25.6	58.8

Spin Speed (kHz)	Bearing Pressure (mbar)	Drive Pressure (mbar)
10	1744	524
15	1751	696
20	1758	848
30	1765	1193
40	1765	1565
50	1765	2199
55	1765	2799
60	1765	4054

Spin Chart
720 slph VT Flow





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Style HFXY
Field Center 701mm

Module Size 1.2mm
Module Material PCTFE
Min Speed 10kHz
Max Speed 60kHz

Spin Speed (kHz)	Bearing Pressure (psi)	Drive Pressure (psi)
10	4.7	2.6
15	5.1	3.7
20	6.6	5.3
30	7.8	8.8
40	9.0	13.6
50	10.9	20.9
55	11.9	26.4
60	12.9	34.6

Spin Speed (kHz)	Bearing Pressure (mbar)	Drive Pressure (mbar)
10	324	179
15	352	255
20	455	365
30	538	607
40	621	938
50	752	1441
55	820	1820
60	889	2386





Tuning Information

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Serial Number	SN240504	Module Material	PCTFE
Frequency	1200MHz	Style	HFX
Field Center	701mm		

X-Channel			
Trap (pf)	PCB #	Frequency Range	
3.3, 6T	1	301	371
2.7, 6T	2	363	393
1.8, 6T	3	386	465
2.7, 4T	6	31P in XY Mode	
Short	SC	X Mode	

Y-Channel			
Series (pf)	PCB#	Frequency Range	
22	1	116	134
18	2	125	145
15	3	139	161
12	4	154	178
10	5	166	193
8.2	6	182	211
7.5	7	190	220
6.8	8	201	233
5.6	9	216	250
4.7	10	234	271
3.9	11	252	292
3.3	12	268	310
2.7	13	294	324
1.8	14	X Mode	
Short	SC	X Mode	



Tuning Information

Customer University of Warwick **Module Size** 1.2mm
Serial Number SN240504 **Module Material** PCTFE
Frequency 1200MHz **Style** HFX

XY Mode	Series Plug-In PCB#	Trap Plug-In PCB#	X Tune Tube	Y Tune Tube
PC-Na	13	6	UHX	2
P ¹⁵ N	1	6	UHX	7
C ¹⁵ N	1	1	1	7

19F is only available in simultaneous HF mode



Tuning Information

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Serial Number	SN240504	Module Material	PCTFE
Frequency	1200MHz	Style	HFX

X Mode	Series Plug-In PCB#	Trap Plug-In PCB#	X Tune Tube	Y Tune Tube
P	13		UHX	
Al	10		1	
C	10		2	
² H	1		5	
¹⁵ N	SC		6	
¹⁴ N	SC		7	

Tune and observe on the X channel for DR Mode.
 Using the SC series and SC trap with the 9 and 8 tune tubes the tuning can be lowered to 44MHz

X-Channel			
Series (pf)	PCB#	Frequency Range	
Short	SC	56	164
22	1	163	216
8.2	6	215	258
6.8	8	248	288
4.7	10	286	329
3.9	11	327	340
2.7	13	339	364
1.8	14	362	388
Short	SC	444	482
2.7	13	452	487

With UHX Tune Tube
 With UHX Tune Tube



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Probe Acceptance Criterion Sheet 1200MHz 1.2mm HFXY

Spin Rate	10kHz-60kHz	<input checked="" type="checkbox"/>
Magic Angle Adjustment		<input checked="" type="checkbox"/>
Resolution, Adamantane(13C)	.05ppm FWHM, .12ppm @ 10%, .24ppm @ 2%	<input checked="" type="checkbox"/>
PW90 (Measured as PW360-PW180/2)	<i>shim file = Phoenix/p2-HC2</i> <i>.02 ppm</i> <i>.05 ppm</i> <i>0.15 ppm</i>	
1H/19F	<i>1H HC mode @ 18W 2.15us</i> 2.1 <i>1H pw90 = 3.1us in HFCN mode @ 21W</i> <i>19F pw90 = 3.1us in HFCN mode @ 23W</i>	<input checked="" type="checkbox"/>
13C	<i>13C HC mode @ 38W 2.85us</i> 2.9	<input checked="" type="checkbox"/>
31P	<i>13C HCN mode @ 65W 2.85us</i> 2.9	<input type="checkbox"/>
15N	<i>15N HCN mode @ 65W 5.0us</i> 5.0	<input checked="" type="checkbox"/>
* Signal to Noise	*HCN 68:1 *HC 86:1 76:1	<input type="checkbox"/> <input type="checkbox"/>

PhoenixNMR Representative *Pedenour*

Customer *Agals*

* - Signal to noise is dependent on both the system as well as the probe. As PhoenixNMR has no control over your system, we cannot guarantee that this specification can be met. Signal to Noise has been proven on our system with a known signal to noise baseline and the data is included with the probe.

Wobb tuning for HF
sf0 = 1165.019 MHz
sw = 88.785 MHz