Filter Configurations

for High Resolution NMR (and HR MAS)

Version 004

Bruker BioSpin

This manual was written by

Arthur Schwilch

Fällanden, Switzerland

P/N: Z31430
DWG-Nr: 1140004

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Filter Configurations for HR NMR and HR MAS

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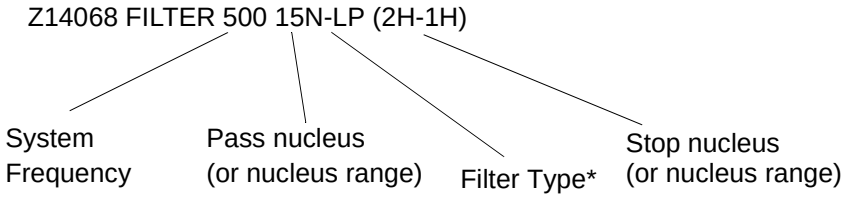
Figure 1.1. High Resolution NMR Filters and Filtercomponents

Introduction 1.1

- The following chapter helps to select the necessary filter type dependent on the preamplifier and the probe.
- System orders with multiple probes require only the combined minimum set of filters.

- Only standard operation is guaranteed with the recommended filter configuration. Non-standard operation (observe on outer coil and decoupling on inner coil) may also be possible with the recommended filter configuration.
- With individual probe orders the current configuration at the customer‘s labs should be obtained to avoid ordering filters which are already at the site.
- If your probe is not included in this list, please fill in the filter requirements questionnaire on ***page 10*** and send it to BBIO-CH, Production Department.
- The exact order number for the corresponding magnet frequency can be taken from the chapter ***"Available Filters (July 2002)" on page 47***.
- No additional filters are necessary in the lock channel.
- No additional filters are necessary for HPPR CRP 15N and 13C modules.
- No additional filters are necessary for HPPR/2 15N and 13C modules.
- For HR MAS are exactly the same filters required as for high resolution NMR (for the corresponding probe).
- All filters should be mounted on the HPPR and not on the probe
- In cause of more than one filter, the 2H stop should be mounted closer to the HPPR
- Explanation of the filter nomenclature:



*) LP=low pass, HP= high pass, BP=band pass

- For use of outfaced filters (not mentioned in Table ***page 47***) see previous manual versions (Z31430 Index 1 or 2).

Table 1.1. Currently used preamplifiers for 1H (HR)

Preamplifier	
HPPR 1H PREAMP MODULE 200-400	
HPPR/2 1H LNA MODULE 500-900	
AQS 1H2H PREAMP 300-400[a]	
HPPR/2 1H2H MODULE 300-400[a]	

a coming soon

Table 1.2. Currently used preamplifiers for X (HR)

Preamplifier	
HPPR X-BB19F 2HS MODULE 200-250	
HPPR X-BB19F 2HP MODULE 300-400	
HPPR/2 XBB19F 2HS MODULE 500-700	
HPPR/2 XBB31P 2HS MODULE 750-900	
AQS XBB19F 2HS PREAMP 300-400[a]	
HPPR/2 XBB19F 2HS MODULE 300-400[a]	

a coming soon

Filter Requirements Questionnaire *1.2*

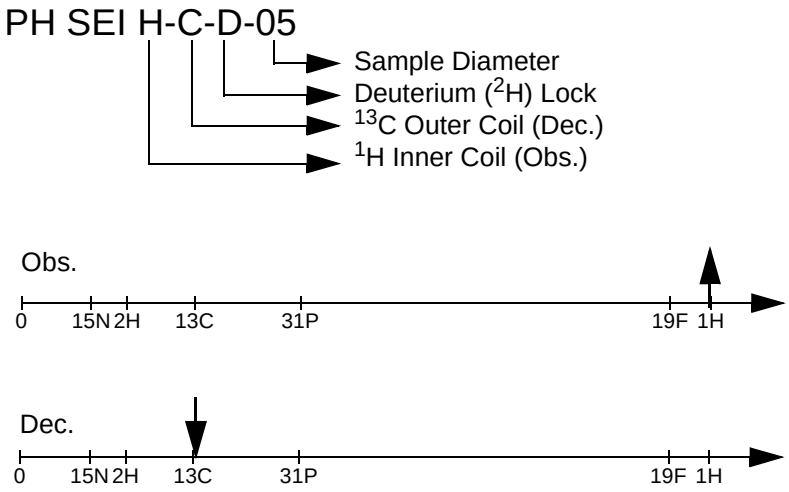
Please fill in the following questionnaire for each probe.

(Part. Nr. / Ser. Nr.)

Bruker Order Number		
Spectrometer Type		
Probe		
Transmitter Configuration	1H	
	19F	
	X	
	Y	
	Z	
HPPR Configuration	1H	
	19F	
	XBB	
	...	
Lock	2H	
	19F	
	2H Lockswitch	
Existing Filter 1		
Existing Filter 2		
...		
Experiment 1	Obs1 {Dec1}	
Experiment 2	Obs2 {Dec2}	
...		

SEI (Selective Inverse) *1.3*

Example:



Required Filters:

Table 1.3. Required Filters for PH SEI H-C-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	0-31P-LP (19F-3H) 
	HPPR X-BB19F 2HP MODULE 300-400 	0-31P-LP (19F-3H)  2H Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P-LP (19F-3H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	-
	AQS XBB19F 2HS PREAMP 300-400 	-
	HPPR/2 XBB19F 2HS MODULE 300-400 	-

13C Observe/ 1H Decoupling might be possible with this configuration.

Table 1.4. Required Filters for PH SEI H-F-D

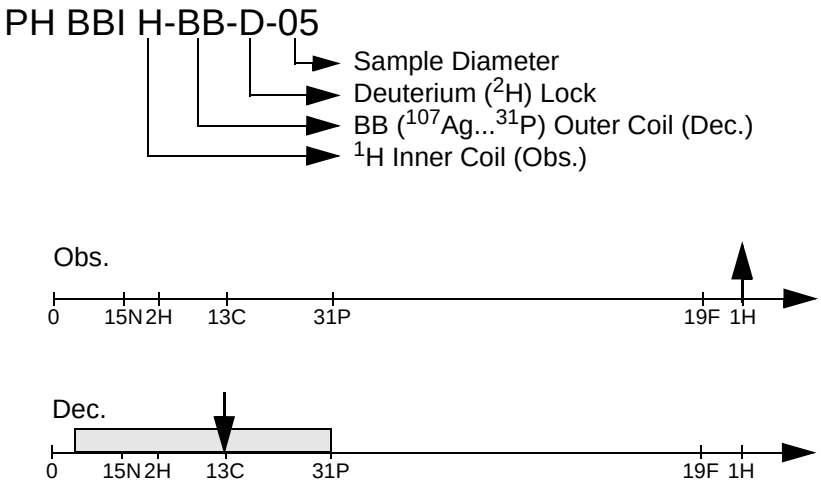
Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	1H-PASS / 19-F STOP 
	HPPR/2 1H LNA MODULE 500-900 	1H-PASS / 19-F STOP 
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	0-31P,19F-LP (1H) 
	HPPR X-BB19F 2HP MODULE 300-400 	2H Stop  0-31P,19F-LP (1H) 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P,19F-LP (1H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	not possible
	AQS XBB19F 2HS PREAMP 300-400 	-[a]
	HPPR/2 XBB19F 2HS MODULE 300-400 	-

a only for ECL<=1: Filter 0-31P,19F-LP(1H) is required for 19F Observe and 1H Decoupling

19F Observe/1H Decoupling might be possible with this configuration.

BBI (Broad Band Inverse) *1.4*

Example:



Required Filters:

Table 1.5. Required Filters for PH BBI H-BB-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
	HPPR 1H PREAMP MODULE 200-400 	-
Decoupling Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	0-31P-LP (19F-3H) 
	HPPR X-BB19F 2HP MODULE 300-400 	0-31P-LP (19F-3H)  2H Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P-LP (19F-3H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	-
	AQS XBB19F 2HS PREAMP 300-400 	-
	HPPR/2 XBB19F 2HS MODULE 300-400 	-

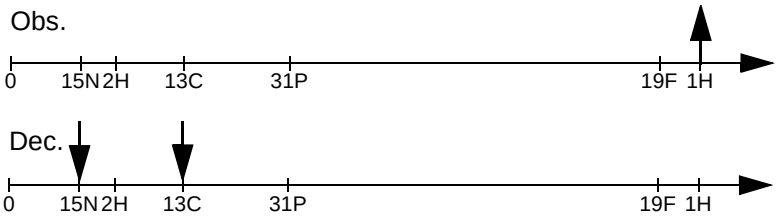
X Observe/ 1H Decoupling might be possible with this configuration.

TXI (Triple X-Nuclei Inverse) *1.5*

Example:

PH TXI H-C/N-D-05

- Sample Diameter
- Deuterium (^{2}H) Lock
- ^{15}N and ^{13}C Outer Coil (Dec.)
- ^{1}H Inner Coil (Obs.)



Required Filters:

Table 1.6. Required Filters for PH TXI H-C/N-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path X-BB Preamplifier 13C	HPPR X-BB19F 2HS MODULE 200-250 	0-31P-LP (19F-3H)  13C-Pass / 2H-Stop 
	HPPR X-BB19F 2HP MODULE 300-400 	0-31P-LP (19F-3H)  13C-Pass / 2H-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P-LP (19F-3H)  13C-Pass / 2H-Stop 
	HPPR/2 XBB31P 2HS MODULE 750-900 	13C-Pass / 2H-Stop 
	AQS XBB19F 2HS PREAMP 300-400 	13C-Pass / 2H-Stop 
	HPPR/2 XBB19F 2HS MODULE 300-400 	13C-Pass / 2H-Stop 
Decoupling Path 15N	-no Preamplifier or some X Preamplifier	15N-Pass / 2H-Stop 

13C Observe/ 1H Decoupling might be possible with this configuration.

For 15N Observe the X-BB Preamplifier must be plugged in the 15N channel.

Table 1.7. Required Filters for PH TXI H-C/P-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path X-BB Preamplifier 13C	HPPR X-BB19F 2HS MODULE 200-250 	13C-Pass / 31P-Stop 
	HPPR X-BB19F 2HP MODULE 300-400 	13C-Pass / 31P-Stop  13C-Pass / 2H-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	13C-Pass / 31P-Stop 
	HPPR/2 XBB31P 2HS MODULE 750-900 	13C-Pass / 31P-Stop 
	AQS XBB19F 2HS PREAMP 300-400 	13C-Pass / 31P-Stop 
	HPPR/2 XBB19F 2HS MODULE 300-400 	13C-Pass / 31P-Stop 
Decoupling Path 31P	no Preamplifier	0-31P-LP (19F-3H)  31-P-Pass / 2H-Stop 
	HPPR X-BB19F 2HS MODULE 200-250 	31-P-Pass /13C-Stop 
	HPPR X-BB19F 2HP MODULE 300-400 	31-P-Pass / 2H-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	31-P-Pass /13C-Stop 
	HPPR/2 XBB31P 2HS MODULE 750-900 	31-P-Pass /13C-Stop 
	AQS XBB19F 2HS PREAMP 300-400 	31-P-Pass /13C-Stop 
	HPPR/2 XBB19F 2HS MODULE 300-400 	31-P-Pass /13C-Stop 

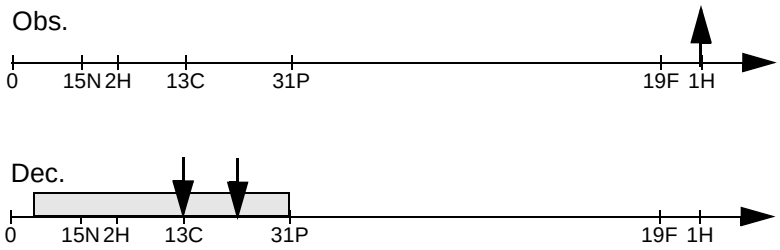
13C Observe/ 1H Decoupling might be possible with this configuration.
For 31P Observe the X-BB Preamplifier must be plugged in the 31P channel.

TBI (Triple Broad Band Inverse) *1.6*

Example:

PH TBI H-C/BB-D-05

- Sample Diameter
- Deuterium (^{2}H) Lock
- ^{13}C and BB (^{107}Ag...^{31}P) Outer Coil (Dec.)
- ^{1}H Inner Coil (Obs.)



Required Filters:

Table 1.8. Required Filters for PH TBI H-C/BB-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path X-BB Preamplifier 13C	HPPR X-BB19F 2HS MODULE 200-250 	a b
	HPPR X-BB19F 2HP MODULE 300-400 	a b
	HPPR/2 XBB19F 2HS MODULE 500-700 	a b
	HPPR/2 XBB31P 2HS MODULE 750-900 	a b
	AQS XBB19F 2HS PREAMP 300-400 	a b
	HPPR/2 XBB19F 2HS MODULE 300-400 	a b
Decoupling Path BB	-no Preamplifier or some X Preamplifier	a b

a For 13C and 15N decoupling filter requirements is the same as ***"Required Filters for PH TXI H-C/N-D" on page 17***

b For 13C and 31P decoupling filter requirements is the same as ***"Required Filters for PH TXI H-C/P-D" on page 18***

For additional decoupling nuclei please contact the nearest local Bruker office.

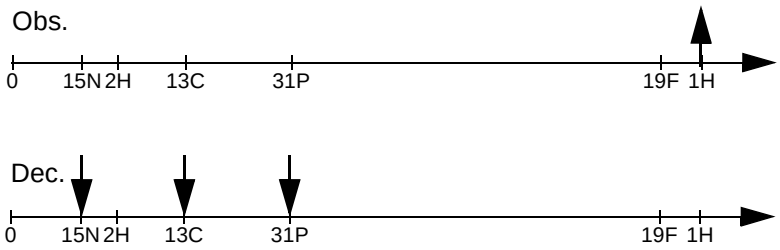
13C Observe/ 1H Decoupling might be possible with this configuration.

QXI (Quattro X-Nuclei Inverse) *1.7*

Example:

PH QXI H/P-C/N-D-05

- Sample Diameter
- Deuterium (^{2}H) Lock
- 15N and 13C Outer Coil (Dec.)
- 31P Inner Coil (Dec.)
- 1H Inner Coil (Obs.)



Required Filters:

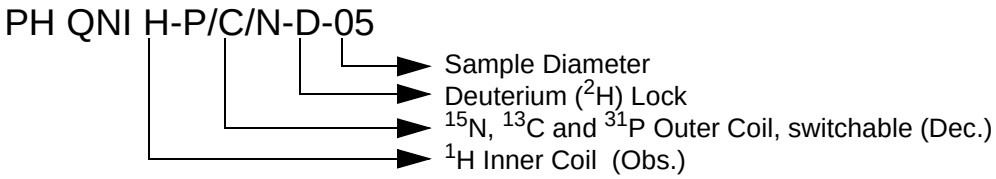
Table 1.9. Required Filters for PH QXI H/P-C/N-D

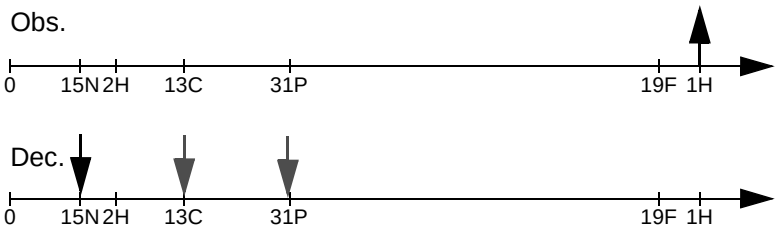
Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path X-BB Preamplifier 13C	HPPR X-BB19F 2HS MODULE 200-250 	13C-BP (0-SI,11B-H) 
	HPPR X-BB19F 2HP MODULE 300-400 	13C-BP (0-SI,11B-H) 
	HPPR/2 XBB19F 2HS MODULE 500-700 	13C-BP (0-SI,11B-H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	13C-BP (0-SI,11B-H) 
	AQS XBB19F 2HS PREAMP 300-400 	13C-BP (0-SI,11B-H) 
	HPPR/2 XBB19F 2HS MODULE 300-400 	13C-BP (0-SI,11B-H) 
Decoupling Path 15N	no Preamplifier or some X Preamplifier	15N-Pass / 2H-Stop 
Decoupling Path 31P	no Preamplifier or some X Preamplifier	31P-BP(0-11B,19F-H) 

13C Observe/ 1H Decoupling might be possible with this configuration.

QNI (Quattro Nuclei Inverse) *1.8*

Example:





Required Filters:

Table 1.10. Required Filters for PH QNI H-P/C/N-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	0-31P-LP (19F-3H) 
	HPPR X-BB19F 2HP MODULE 300-400 	0-31P-LP (19F-3H)  2H-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P-LP (19F-3H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	-
	AQS XBB19F 2HS PREAMP 300-400 	-
	HPPR/2 XBB19F 2HS MODULE 300-400 	-

X Observe / 1H Decoupling might be possible with this configuration.

Table 1.11. Required Filters for PH QNI H-F/P/C -D

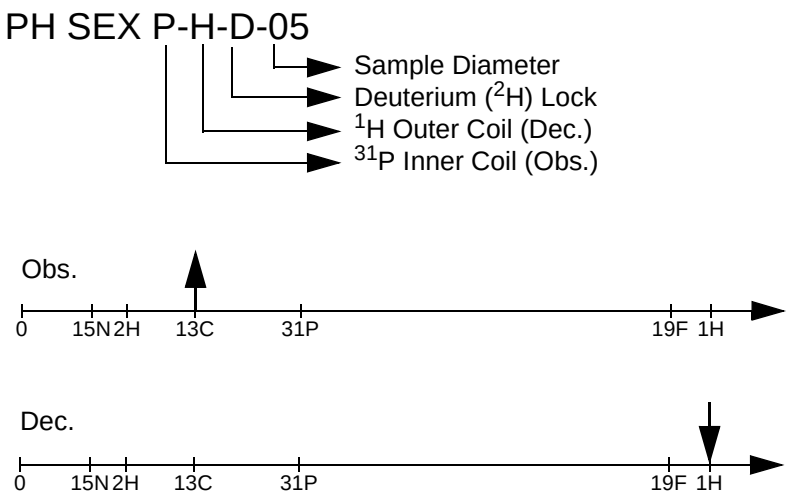
Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	1H-Pass / 19F-Stop 
	HPPR/2 1H LNA MODULE 500-900 	1H-Pass / 19F-Stop 
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	0-31P,19F-LP (1H) 
	HPPR X-BB19F 2HP MODULE 300-400 	0-31P,19F-LP (1H)  2H-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P,19F-LP (1H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	19F decoupling not possible
	AQS XBB19F 2HS PREAMP 300-400 	-[a]
	HPPR/2 XBB19F 2HS MODULE 300-400 	-

a only for ECL <=1 and 19F(1H) Experiment, Filter 0-31P,19F-LP(1H) is required

X Observe / 1H Decoupling might be possible with this configuration.

SEX, Dual (Selective X-Nuclei) *1.9*

Example:



Required Filters:

Table 1.12. Required Filters for PH SEX C-H-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path X-BB Preamplifier 13C	HPPR X-BB19F 2HS MODULE 200-250 	0-31P-LP (19F-3H) 
	HPPR X-BB19F 2HP MODULE 300-400 	0-31P-LP (19F-3H)  2H-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P-LP (19F-3H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	-
	AQS XBB19F 2HS PREAMP 300-400 	-
	HPPR/2 XBB19F 2HS MODULE 300-400 	-
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-

1H Observe / 13C Decoupling might be possible with this configuration.

Table 1.13. Required Filters for PH SEX 3H-H-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 3H Preamplifier	HPPR 3H PREAMP MODULE 250-400 	3H-HP(1H) 
	HPPR/2 3H MODULE 	3H-HP(1H) 
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	1H-LP(3H) 
	HPPR/2 1H LNA MODULE 500-900 	1H-LP(3H) 
	AQS 1H2H PREAMP 300-400 	1H-LP(3H) 
	HPPR/2 1H2H MODULE 300-400 	1H-LP(3H) 

1H Observe/ 3H Decoupling might be possible with this configuration.

Table 1.14. Required Filters for PH SEX 2H-H-F

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 2H Preamplifier	HPPR 2H PREAMP MODULE 200-400 	-
	HPPR/2 2H MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	1H-Pass / 19F-Stop 
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-

1H Observe/ 2H Decoupling might be possible with this configuration.

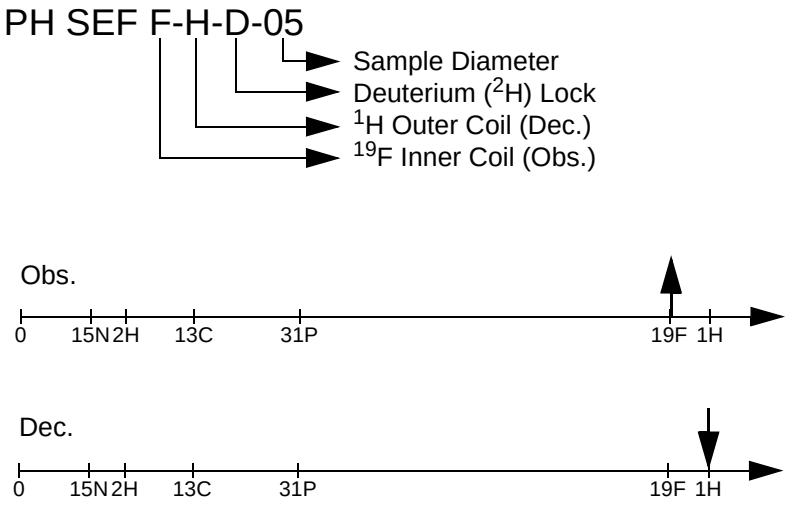
Table 1.15. Filters for PH SEX X-H-D (x=all X-nuclei except 2H, 3H, 13C)

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	-
	HPPR X-BB19F 2HP MODULE 300-400 	2H-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	-
	HPPR/2 XBB31P 2HS MODULE 750-900 	-
	AQS XBB19F 2HS PREAMP 300-400 	-
	HPPR/2 XBB19F 2HS MODULE 300-400 	-
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-

1H Observe / X Decoupling might be possible with this configuration.

SEF (Selective 19F) *1.10*

Example:



Required Filters:

Table 1.16. Required Filters for PH SEF F-H-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path 19F Preamplifier	HPPR 19F PREAMP MODULE 	0-31P,19F-LP (1H) 
	HPPR/2 19F MODULE 	0-31P,19F-LP (1H) 
	HPPR X-BB19F 2HS MODULE 200-250 	0-31P,19F-LP (1H) 
	HPPR X-BB19F 2HP MODULE 300-400 	0-31P,19F-LP (1H)  2H-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P,19F-LP (1H) 
	AQS XBB19F 2HS PREAMP 300-400 	-[a]
	HPPR/2 XBB19F 2HS MODULE 300-400 	-
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	1H-PASS /19F-STOP 
	HPPR/2 1H LNA MODULE 500-900 	1H-PASS /19F-STOP 
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-

a only for ECL <=1 Filter 0-31P,19F-LP(1H) is required

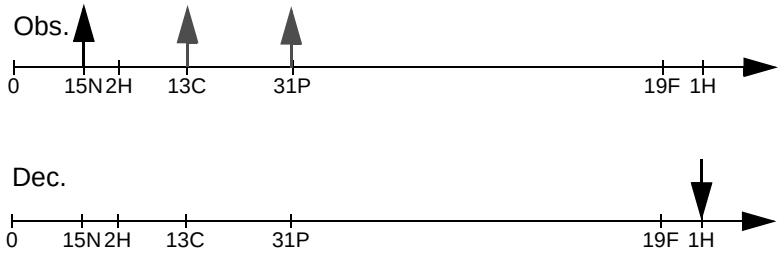
1H Observe / 19F Decoupling might be possible with this configuration.

QNP (Quattro Nuclei Probe) *1.11*

Example:

PH QNP P/C/N-H-D-05

- Sample Diameter
- Deuterium (^{2}H) Lock
- ^{1}H Outer Coil (Dec.)
- ^{15}N, ^{13}C and ^{31}P Inner Coil switchable (Obs.)



Required Filters:

Table 1.17. Required Filters for PH QNP P/C/N-H-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	0-31P-LP (19F-3H) 
	HPPR X-BB19F 2HP MODULE 300-400 	2H-Stop  0-31P-LP (19F-3H) 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P-LP (19F-3H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	-
	AQS XBB19F 2HS PREAMP 300-400 	-
	HPPR/2 XBB19F 2HS MODULE 300-400 	-
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-

1H Observe / X Decoupling might be possible with this configuration.

Table 1.18. Required Filters for PH QNP F/P/C -H-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	0-31P,19F-LP (1H)  0-31P-LP (19F-3H)[a] 
	HPPR X-BB19F 2HP MODULE 300-400 	2H-Stop  0-31P,19F-LP (1H)  0-31P-LP (19F-3H)[a] 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P,19F-LP (1H)  0-31P-LP (19F-3H)[a] 
	HPPR/2 XBB31P 2HS MODULE 750-900 	19F observe not possible
	AQS XBB19F 2HS PREAMP 300-400 	-[b]
	HPPR/2 XBB19F 2HS MODULE 300-400 	-
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	1H-Pass / 19F-Stop 
	HPPR/2 1H LNA MODULE 500-900 	1H-Pass / 19F-Stop 
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-

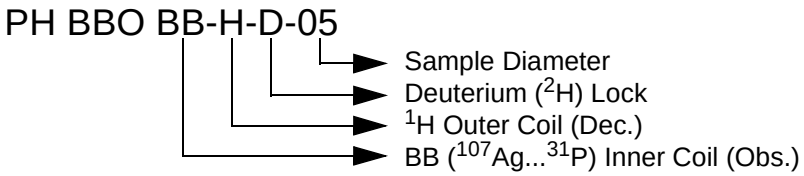
a This filter is only necessary for 13C decoupling and must be removed for 19F decoupling or observe

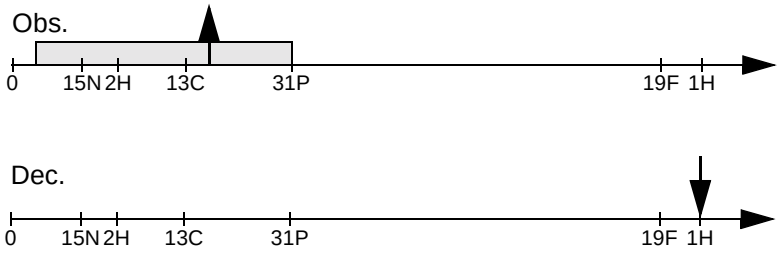
b only for ECL <=1 Filter 0-31P,19F-LP(1H) is required

1H Observe / X Decoupling might be possible with this configuration.

BBO (Broad Band Observe) *1.12*

Example:





Required Filters:

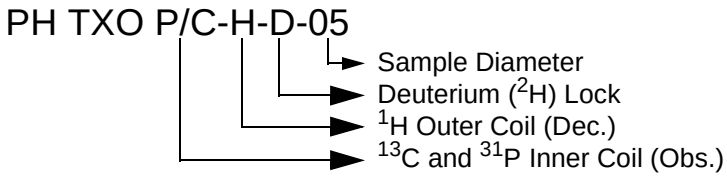
Table 1.19. Required Filters for PH BBO BB-H-D

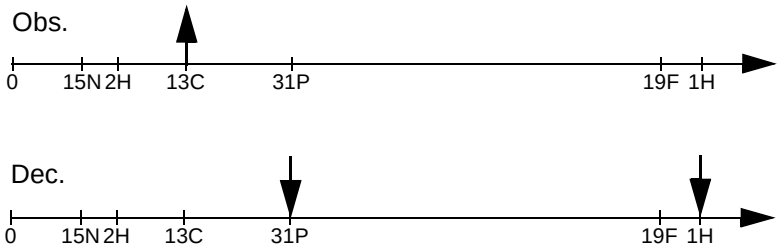
Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	0-31P-LP (19F-3H) 
	HPPR X-BB19F 2HP MODULE 300-400 	2H-Stop  0-31P-LP (19F-3H) 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P-LP (19F-3H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	-
	AQS XBB19F 2HS PREAMP 300-400 	-
	HPPR/2 XBB19F 2HS MODULE 300-400 	-
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-

1H Observe / X Decoupling might be possible with this configuration.

TXO (Triple X-Nuclei Observe) *1.13*

Example:





Required Filters:

Table 1.20. Required Filters for PH TXO X/Y-H-D (without 19F)

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	X-Pass / Y-Stop 
	HPPR X-BB19F 2HP MODULE 300-400 	2H-Stop  X-Pass / Y-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	X-Pass / Y-Stop 
	HPPR/2 XBB31P 2HS MODULE 750-900 	X-Pass / Y-Stop 
	AQS XBB19F 2HS PREAMP 300-400 	X-Pass / Y-Stop 
	HPPR/2 XBB19F 2HS MODULE 300-400 	X-Pass / Y-Stop 
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path Y	-no Preamplifier	2H Stop  Y-Pass / X-Stop 
	HPPR X-BB19F 2HS MODULE 200-250 	Y-Pass / X-Stop 
	HPPR X-BB19F 2HP MODULE 300-400 	2H Stop  Y-Pass / X-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	Y-Pass / X-Stop 
	HPPR/2 XBB31P 2HS MODULE 750-900 	Y-Pass / X-Stop 
	AQS XBB19F 2HS PREAMP 300-400 	Y-Pass / X-Stop 
	HPPR/2 XBB19F 2HS MODULE 300-400 	Y-Pass / X-Stop 

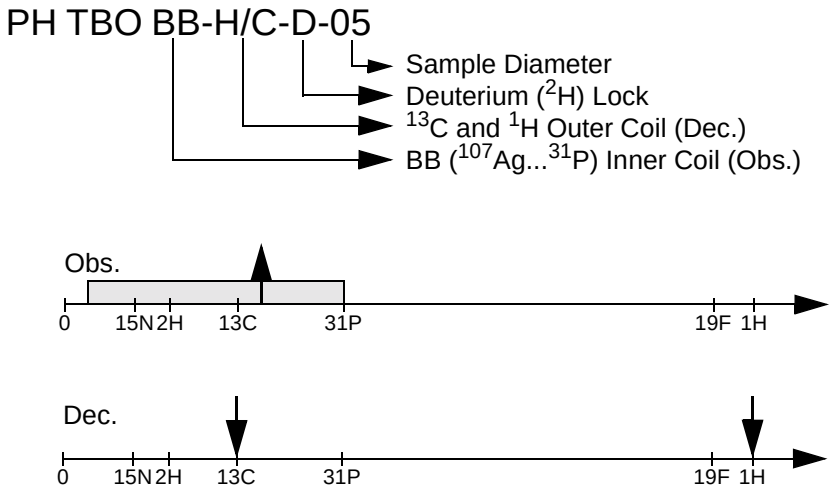
Table 1.21. Required Filters for PH TXO F/Y-H-D (with X=19F)

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	19F Bandpass 
	HPPR X-BB19F 2HP MODULE 300-400 	19F Bandpass 
	HPPR/2 XBB19F 2HS MODULE 500-700 	19F Bandpass 
	HPPR/2 XBB31P 2HS MODULE 750-900 	-not possible
	AQS XBB19F 2HS PREAMP 300-400 	19F Bandpass 
	HPPR/2 XBB19F 2HS MODULE 300-400 	19F Bandpass 
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	1H-Pass / 19F-Stop 
	HPPR/2 1H LNA MODULE 500-900 	1H-Pass / 19F-Stop 
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path Y	no Preamplifier	2H-Stop  0-31P-LP (19F-3H) 
	HPPR X-BB19F 2HS MODULE 200-250 	0-31P-LP (19F-3H) 
	HPPR X-BB19F 2HP MODULE 300-400 	2H-Stop  0-31P-LP (19F-3H) 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P-LP (19F-3H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	-
	AQS XBB19F 2HS PREAMP 300-400 	0-31P-LP (19F-3H) 
	HPPR/2 XBB19F 2HS MODULE 300-400 	0-31P-LP (19F-3H) 

Y Observe, 19F and 1H Decoupling might be possible with this configuration.

TBO (Triple Broad Band Observe) *1.14*

Example:



Required Filters:

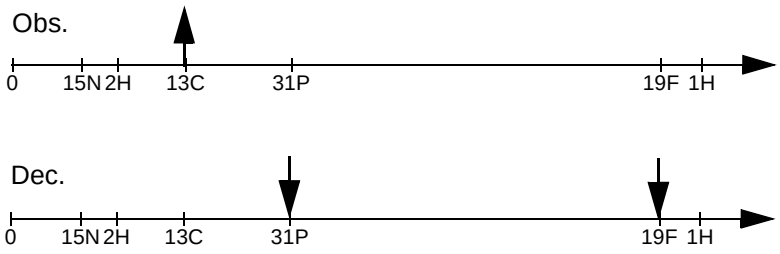
Please contact the nearest Bruker head office for TBO filter requirements.

TXD (Triple X-Nuclei Double Decoupling) *1.15*

Example:

PH TXD C-F/P-D-05

- Sample Diameter
- Deuterium (^{2}H) Lock
- ^{31}P and ^{19}F Outer Coil (Dec.)
- ^{13}C Inner Coil (Obs.)



Required Filters:

Table 1.22. Required Filters for PH TXD X-H/Y-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	X-Pass / Y-Stop 
	HPPR X-BB19F 2HP MODULE 300-400 	2H-Stop  X-Pass / Y-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	X-Pass / Y-Stop 
	HPPR/2 XBB31P 2HS MODULE 750-900 	X-Pass / Y-Stop 
	AQS XBB19F 2HS PREAMP 300-400 	X-Pass / Y-Stop 
	HPPR/2 XBB19F 2HS MODULE 300-400 	X-Pass / Y-Stop 
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path Y	no Preamplifier	2H Stop  Y-Pass / X-Stop 
	HPPR X-BB19F 2HS MODULE 200-250 	Y-Pass / X-Stop 
	HPPR X-BB19F 2HP MODULE 300-400 	2H Stop  Y-Pass / X-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	Y-Pass / X-Stop 
	HPPR/2 XBB31P 2HS MODULE 750-900 	Y-Pass / X-Stop 
	AQS XBB19F 2HS PREAMP 300-400 	Y-Pass / X-Stop 
	HPPR/2 XBB19F 2HS MODULE 300-400 	Y-Pass / X-Stop 

Table 1.23. Required Filters for PH TXD X-F/Z-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	X-Pass / Y-Stop 
	HPPR X-BB19F 2HP MODULE 300-400 	2H-Stop  X-Pass / Y-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	X-Pass / Y-Stop 
	HPPR/2 XBB31P 2HS MODULE 750-900 	X-Pass / Y-Stop 
	AQS XBB19F 2HS PREAMP 300-400 	X-Pass / Y-Stop 
	HPPR/2 XBB19F 2HS MODULE 300-400 	X-Pass / Y-Stop 
Decoupling Path Y (19F)	no preampliferi or some X preamplifier	19F Bandpass 
Decoupling Path Z	no preamplifer	2H Stop  Z-Pass / X-Stop 
	HPPR X-BB19F 2HS MODULE 200-250 	Z-Pass / X-Stop 
	HPPR X-BB19F 2HP MODULE 300-400 	Z-Pass / X-Stop 
	HPPR/2 XBB19F 2HS MODULE 500-700 	Z-Pass / X-Stop 
	HPPR/2 XBB31P 2HS MODULE 750-900 	Z-Pass / X-Stop 
	AQS XBB19F 2HS PREAMP 300-400 	Z-Pass / X-Stop 
	HPPR/2 XBB19F 2HS MODULE 300-400 	Z-Pass / X-Stop 

Table 1.24. Required Filters for PH TXD X-H/F-D

Channel (Obs./Dec.)	Preamplifier Module Type	Required Filters
Observe Path X-BB Preamplifier	HPPR X-BB19F 2HS MODULE 200-250 	0-31P-LP (19F-3H) 
	HPPR X-BB19F 2HP MODULE 300-400 	2H-Stop  0-31P-LP (19F-3H) 
	HPPR/2 XBB19F 2HS MODULE 500-700 	0-31P-LP (19F-3H) 
	HPPR/2 XBB31P 2HS MODULE 750-900 	-
	AQS XBB19F 2HS PREAMP 300-400 	0-31P-LP (19F-3H) 
	HPPR/2 XBB19F 2HS MODULE 300-400 	0-31P-LP (19F-3H) 
Decoupling Path 1H Preamplifier	HPPR 1H PREAMP MODULE 200-400 	-
	HPPR/2 1H LNA MODULE 500-900 	-
	AQS 1H2H PREAMP 300-400 	-
	HPPR/2 1H2H MODULE 300-400 	-
Decoupling Path y (19F)	no preamplifier or some X preamplifier	19F Bandpass 

Filter Configurations for CP MAS

2

Introduction 2.1

CP MAS filters will not be any longer supplied from BBIO-CH. For part numbers of all CP MAS filters please consult manual Z31481 (Power Filter) or contact BBIO-FR.

Filter Configurations for CP MAS

Available Filters (July 2002) 3

Z00113 FILTER 100 2H STOP
Z14345 FILTER 100 0-31P,19F-LP (1H)
Z6603 FILTER 100 LOW PASS 1H STOP

Z13281 FILTER 200 1H-PASS / 19F-STOP
Z00106 FILTER 200 2H PASS
Z00114 FILTER 200 2H STOP
Z13742 FILTER 200 2H-PASS / 13C-STOP
Z13327 FILTER 200 0-31P,19F-LP (1H)
Z14329 FILTER 200 0-31P-LP (19F-3H)
Z13088 FILTER 200 11B-PASS / 13C-STOP
Z41000 FILTER 200 11B-PASS / 31P-STOP
Z13087 FILTER 200 13C-PASS / 11B-STOP
Z13739 FILTER 200 13C-PASS / 15N-STOP
Z13083 FILTER 200 13C-PASS / 2H-STOP
Z6842 FILTER 200 13C-PASS / 31P-STOP
Z13740 FILTER 200 13C-PASS /29SI-STOP
Z13741 FILTER 200 15N-PASS / 13C-STOP
Z13908 FILTER 200 19F-BANDPASS
Z12967 FILTER 200 23NA-PASS /31P-STOP
Z13015 FILTER 200 27AL-PASS /31P-STOP
Z13744 FILTER 200 29SI-PASS /11B-STOP
Z13743 FILTER 200 29SI-PASS /13C-STOP
Z41001 FILTER 200 31P-PASS / 11B-STOP
Z6843 FILTER 200 31P-PASS / 13C-STOP
Z12968 FILTER 200 31P-PASS /23NA-STOP
Z13111 FILTER 200 LDA/4-TRAFO 13C/31P

Z13279 FILTER 250 1H-PASS / 19F-STOP
Z00107 FILTER 250 2H PASS
Z00115 FILTER 250 2H STOP

Z13439 FILTER 250 3H-PASS / 1H-STOP
Z13328 FILTER 250 0-31P,19F-LP (1H)
Z14330 FILTER 250 0-31P-LP (19F-3H)
Z12810 FILTER 250 103RH-PASS/31P-STOP
Z13894 FILTER 250 117SN-PASS/13C-STOP
Z13892 FILTER 250 117SN-PASS/31P-STOP
Z9146 FILTER 250 13C-PASS / 2H-STOP
Z6818 FILTER 250 13C-PASS / 31P-STOP
Z13893 FILTER 250 13C-PASS/117SN-STOP
Z13375 FILTER 250 14N-PASS/195PT-STOP
Z42386 FILTER 250 15N-PASS / 2H-STOP
Z13376 FILTER 250 195PT-PASS/14N-STOP
Z13902 FILTER 250 19F-BANDPASS
Z9774 FILTER 250 205TL-PASS/ 1H-STOP
Z6819 FILTER 250 31P-PASS / 13C-STOP
Z12811 FILTER 2531P-PASS/103RH-STOP
Z13891 FILTER 250 31P-PASS/117SN-STOP

Z13270 FILTER 300 1H-PASS / 19F-STOP
Z13763 FILTER 300 1H-LP(3H)
Z00108 FILTER 300 2H PASS
Z00116 FILTER 300 2H STOP
Z9327 FILTER 300 2H-PASS / 13C-STOP
Z9330 FILTER 300 2H-PASS / 15N-STOP
Z7781 FILTER 300 2H-PASS / 19F-STOP
Z13764 FILTER 300 3H-PASS / 1H-STOP
Z13329 FILTER 300 0-31P,19F-LP (1H)
Z14331 FILTER 300 0-31P-LP (19F-3H)
Z13029 FILTER 300 119SN-P 13C-29SI-ST
Z8742 FILTER 300 119SN-PASS/31P-STOP
Z9229 FILTER 300 11B-PASS / 31P-STOP
Z13972 FILTER 300 13C-BP (0-2H,P-H)
Z9328 FILTER 300 13C-PASS / 2H-STOP
Z12853 FILTER 300 13C-PASS / 14N-STOP
Z8955 FILTER 300 13C-PASS / 15N-STOP
Z6845 FILTER 300 13C-PASS / 31P-STOP
Z9329 FILTER 300 15N-PASS / 2H-STOP

Z8954 FILTER 300 15N-PASS / 13C-STOP
Z7780 FILTER 300 15N-PASS / 6LI-STOP
Z13773 FILTER 300 19F-BANDPASS
Z42428 FILTER 300 27A-PASS / 31P-STOP
Z15174 FILTER 300 31P BP(0-11B,19F-H)
Z9228 FILTER 300 31P-PASS / 11B-STOP
Z6844 FILTER 300 31P-PASS / 13C-STOP
Z42427 FILTER 300 31P-PASS / 27A-STOP
Z8741 FILTER 300 31P-PASS /119S-STOP
Z13373 FILTER 300 31P-PASS/195PT-STOP
Z9244 FILTER 300 6LI-PASS / 2H-STOP
Z7779 FILTER 300 6LI-PASS / 15N-STOP
Z9384 FILTER 300 LDA/4-TRAFO 13C/31P

Z13284 FILTER 360 1H-PASS / 19F-STOP
Z00109 FILTER 360 2H PASS
Z00117 FILTER 360 2H STOP
Z13330 FILTER 360 0-31P,19F-LP (1H)
Z14332 FILTER 360 0-31P-LP (19F-3H)
Z42364 FILTER 360 13C-PASS / 2H-STOP
Z8829 FILTER 360 13C-PASS / 15N-STOP
Z6828 FILTER 360 13C-PASS / 31P-STOP
Z42363 FILTER 360 15N-PASS / 2H-STOP
Z8830 FILTER 360 15N-PASS / 13C-STOP
Z13903 FILTER 360 19F-BANDPASS
Z6829 FILTER 360 31P-PASS / 13C-STOP
Z41153 FILTER 360 LDA/4-TRAFO 13C/31P

Z13271 FILTER 400 1H-PASS / 19F-STOP
Z14180 FILTER 400 1H-LP(3H)
Z6850 FILTER 400 1H-PASS/205TL-STOP
Z00118 FILTER 400 2H STOP
Z9032 FILTER 400 2H-PASS / 13C-STOP
Z9093 FILTER 400 2H-PASS / 15N-STOP
Z12805 FILTER 400 2H-PASS / 171YB-ST
Z5785 FILTER 400 2H-PASS / 31P-STOP
Z13204 FILTER 400 2H-PASS 400W

Z14181 FILTER 400 3H-HP(1H)
Z13331 FILTER 400 0-31P,19F-LP (1H)
Z14333 FILTER 400 0-31P-LP (19F-3H)
Z13148 FILTER 400 10B-PASS / 11B-STOP
Z13149 FILTER 400 11B-PASS / 10B-STOP
Z14107 FILTER 400 13C-BP (0-29SI,P-H)
Z9095 FILTER 400 13C-PASS / 2H-STOP
Z13432 FILTER 400 13C-PASS / 11B-STOP
Z8831 FILTER 400 13C-PASS / 15N-STOP
Z6841 FILTER 400 13C-PASS / 31P-STOP
Z9094 FILTER 400 15N-PASS / 2H-STOP
Z8832 FILTER 400 15N-PASS / 13C-STOP
Z12806 FILTER 400 171YB-PASS / 2H-STO
Z13774 FILTER 400 19F-BANDPASS
Z6849 FILTER 400 205TL-PASS/ 1H-STOP
Z13202 FILTER 400 23NA-PASS /31P-STOP
Z13322 FILTER 400 27AL-PASS /31P-STOP
Z13976 FILTER 400 31P-BP (0-13C,1H)
Z6840 FILTER 400 31P-PASS / 13C-STOP
Z13323 FILTER 400 31P-PASS /27AL-STOP
Z7785 FILTER 400 57FE PASS / 1H-STOP
Z42408 FILTER 400 6LI-PASS / 2H-STOP
Z13017 FILTER 400 LDA/4-TRAFO 13C/31P

Z13272 FILTER 500 1H-PASS / 19F-STOP
Z13794 FILTER 500 1H-PASS / 3H-STOP
Z00111 FILTER 500 2H PASS
Z00119 FILTER 500 2H STOP
Z9031 FILTER 500 2H-PASS / 13C-STOP
Z9033 FILTER 500 2H-PASS / 15N-STOP
Z4637 FILTER 500 2H-PASS / 31P-STOP
Z13696 FILTER 500 2H-PASS / 6LI-STOP
Z13795 FILTER 500 3H-HP (1H)
Z13697 FILTER 500 6LI-PASS / 2H-STOP
Z13698 FILTER 500 6LI-PASS /15N-STOP
Z13332 FILTER 500 0-31P,19F-LP (1H)
Z14334 FILTER 500 0-31P-LP (19F-3H)

Z14299 FILTER 500 117SN-LP (119SN)
Z14300 FILTER 500 119SN-HP (117SN)
Z13226 FILTER 500 119SN-PASS/31P-STOP
Z13114 FILTER 500 11B-PASS / 13C-STOP
Z14067 FILTER 500 13C-BP (0-29SI,P-H)
Z8917 FILTER 500 13C-PASS / 2H-STOP
Z13113 FILTER 500 13C-PASS / 11B-STOP
Z8745 FILTER 500 13C-PASS / 15N-STOP
Z6807 FILTER 500 13C-PASS / 31P-STOP
Z42638 FILTER 500 13C-PASS /203TL-STP
Z8916 FILTER 500 15N-PASS / 2H-STOP
Z8744 FILTER 500 15N-PASS / 13C-STOP
Z13692 FILTER 500 15N-PASS /29SI-STOP
Z13597 FILTER 500 19F-BANDPASS
Z12866 FILTER 500 19F-PASS / 31P-STOP
Z13346 FILTER 500 19F-PASS /205TL-STP
Z42639 FILTER 500 203T-PASS / 13C-STP
Z13345 FILTER 500 205TL-PASS /19F-STP
Z13693 FILTER 500 29SI-PASS /15N-STOP
Z13144 FILTER 500 29SI-PASS/31P-STOP
Z14071 FILTER 500 31P-BP (0-13C,1H)
Z6808 FILTER 500 31P-PASS / 13C-STOP
Z13145 FILTER 500 31P-PASS/29SI-STOP
Z8891 FILTER 500 LDA/4-TRAFO 13C/31P

Z13273 FILTER 600 1H-PASS / 19F-STOP
Z14042 FILTER 600 1H-PASS / 3H-STOP
Z6684 FILTER 600 2H PASS
Z6685 FILTER 600 2H STOP
Z9087 FILTER 600 2H-PASS / 13C-STOP
Z9089 FILTER 600 2H-PASS / 15N-STOP
Z8753 FILTER 600 2H-PASS / 19F-STOP
Z14260 FILTER 600 3H-HP(1H)
Z13333 FILTER 600 0-31P,19F-LP (1H)
Z14335 FILTER 600 0-31P-LP (19F-3H)
Z14631 FILTER 600 13C-BP (0-29Si,P-H)
Z9086 FILTER 600 13C-PASS / 2H-STOP

Z4132 FILTER 600 13C-PASS / 15N-STOP
Z6901 FILTER 600 13C-PASS / 31P-STOP
Z9088 FILTER 600 15N-PASS / 2H-STOP
Z4131 FILTER 600 15N-PASS / 13C-STOP
Z13904 FILTER 600 19F-BANDPASS
Z14632 FILTER 600 31P-BP (0-13C,1H)
Z15088 FILTER 600 31P-HP (2H)
Z6900 FILTER 600 31P-PASS / 13C-STOP

Z14547 FILTER 700 1H-PASS / 19F-STOP
Z14841 FILTER 700 0-13C-LP (31P)
Z13501 FILTER 700 0-31P-LP (19F-3H)
Z15283 FILTER 700 13C BP(0-29SI,P-H)
Z13500 FILTER 700 13C-PASS / 2H-STOP
Z14711 FILTER 700 13C-1H HP(15N)
Z15284 FILTER700 15N BP (2H-1H)
Z13498 FILTER 700 15N-PASS / 2H-STOP
Z13905 FILTER 700 19F-BANDPASS
Z15105 FILTER 700 31P BP(0-11B,19F-H)
Z14842 FILTER 700 31P-1H-HP (2H)

Z13286 FILTER 750 1H-PASS / 19F-STOP
Z7836 FILTER 750 2H PASS
Z12935 FILTER 750 2H STOP
Z13099 FILTER 750 2H-PASS / 15N-STOP
Z14336 FILTER 750 0-31P-LP (19F-3H)
Z14216 FILTER 750 13C-BP (0-29SI,P-H)
Z41122 FILTER 750 13C-PASS / 2H-STOP
Z12864 FILTER 750 13C-PASS / 15N-STOP
Z12812 FILTER 750 13C-PASS / 31P-STOP
Z41123 FILTER 750 15N-PASS / 2H-STOP
Z12865 FILTER 750 15N-PASS / 13C-STOP
Z13906 FILTER 750 19F-BANDPASS
Z13334 FILTER 750 19F-PASS / 1H-STOP
Z12813 FILTER 750 31P-PASS / 13C-STOP
Z15033 FILTER 750 31P-HP (2H)

Z13288 FILTER 800 1H-PASS / 19F-STOP

Z12937 FILTER 800 2H STOP

Z7839 FILTER 800 2H-PASS / 15N-STOP

Z13936 FILTER 800 0-13C LP (31P)

Z13937 FILTER 800 0-31P-LP (19F-3H)

Z7837 FILTER 800 13C-PASS / 2H-STOP

Z13936 FILTER 800 13C-PASS / 31P-STOP

Z7838 FILTER 800 15N-PASS / 2H-STOP

Z13909 FILTER 800 19F-BANDPASS

Z13335 FILTER 800 19F-PASS / 1H-STOP

Z13938 FILTER 800 31P-1H HP (2H)

Z14645 FILTER 900 0-13C-LP (31P)

Z13551 FILTER 900 0-15N-LP(2H,19F-1H)

Z14123 FILTER 900 0-31P-LP (19F-3H)

Z13550 FILTER 900 13C-1H-HP (2H)

Z13907 FILTER 900 19F-BANDPASS

Available Filters (July 2002)

Tables

Tables

Notes