



CryoProbe™

Safety Information & Customer Certificate

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IMPORTANT

Please read the information in this document *carefully* before handling your CryoProbe!

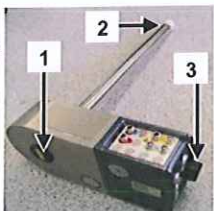


● **Important Instructions: Do Read before Using CryoProbe (CP) or CryoProbe Prodigy (CPP)**



NMR CryoProbe™

Step	Action
NOTICE	
    	<p>PACKAGING:</p> <ul style="list-style-type: none"> When handling the CryoProbe (e.g. unpacking, mounting in the magnet) do not apply any force on the probe tube. For further details please read <u>CryoProbe System User Manual or CryoProbe Prodigy User Manual.</u> Keep the CryoProbe in the Bruker storage box until you want to mount it in the magnet. Remove the plastic protection cover on the tube just before mounting the CryoProbe. Always hold the CryoProbe by its body! The CryoProbe is an electrostatic discharge sensitive (ESD) device. Keep the original packing material (Bruker storage box, cardboard crate, wooden pallet) throughout the lifetime of the CryoProbe. In case of return use the packaging material again. <p>MEASURING:</p> <ul style="list-style-type: none"> Always clean the outer surface of the NMR sample tube after inserting it into the spinner and before using it in the CryoProbe. Only use Shigemi tubes with tapered edges. Never insert any foreign objects into the sample cavity. Keep within the specified power levels for the probe on the 'Customer Certificate' delivered with the folder in the Bruker storage box; otherwise the warranty will be void. The specified power levels can be also found via the "edhead" command. Use the "PowerCheck" command. Do not TUNE or MATCH or apply RF power to the CryoProbe when it is not cold. Do not exceed the specified sample temperature limits. Never turn off the VT gas flow when the CryoProbe is cold or cooling down.

SHIPPING INSTRUCTIONS

1	Remove the CryoProbe from the magnet according to the <u>CryoProbe User Manual or CryoProbe Prodigy User Manual.</u>	
2	For all CryoProbes: Attach the following protective devices (see Fig 2): 1. Cover the Tuning/Matching area 2. Cover the CryoProbe's tube 3. Cover the CryoCoupler opening 4. Cover the RF connectors For CryoProbe Prodigy only: Cover Exhaust heater	
3	Insert the CryoProbe into its Bruker storage box (see Fig 3). Accessories such as the Tuning/Matching adaptor, the green Tuning/Matching tool, the vacuum operator etc. do not need to be returned unless requested by Bruker.	
4	Insert the CryoProbe Bruker storage box into the cardboard crate (see Fig 4), which is attached to the wooden pallet. This is required to ensure proper and safe shipping of the CryoProbe.	
5	Complete, sign and place the 'Safety and Repair Declaration form' (included in the binder) in the Bruker storage box. Notice: This applies even though the CryoProbe does not need to be repaired.	
6	The CryoProbe is now ready to be shipped. Notice: If one or more of the above steps cannot be completed, please contact Bruker directly. Contacts can be found on our website www.bruker-biospin.com/contact_us.html . Please feel free to contact your local sales office for additional clarification or information.	

● **Customer Certificate**



NMR CRYO Probe™

P/N: Z151340 S/N: 0001 Type: CP DCH 700S4 C/H-D-05 Z

Declaration

The specified values listed on this page are valid in the context of the technical specification sheet of this probe. Bruker guarantees these values to be achievable on the customer instrument within the restriction mentioned. Any values declared as "Factory Test" are included for information purposes and not part of contractually guaranteed acceptance tests.

Pulse Specification

Nucleus	Sample	90° Pulse (in µs)	Achieved power in factory test (in W)	Maximum allowed peak power (in W)	Remarks
¹ H	Z10263	10.0	13	18	
¹ H	Z10263	80.0	-	-	CPD
² H	Z10263	150	16	23	
¹³ C	Z10263	10.0	29	41	
¹³ C	Z10263	55.0	-	-	CPD

Sensitivities

Nucleus	Sample	Signal-to-Noise Ratio	Remarks
¹ H	Z10120	≥ 3500	noise: 200 Hz variable, method: sino best
¹³ C	Z10163	≥ 3000	noise: 40 ppm variable, method: sino best

Lineshape

Nucleus	Sample	50% (in Hz) ¹	0.55% (in Hz) ¹	0.11% (in Hz) ¹	Spinning side bands (in %)	Remarks
¹ H	Z10701	≤ 0.70	≤ 7.0	≤ 14.0	≤ 1.0	with sample rotation
¹ H	Z10701	≤ 0.80	≤ 8.0	≤ 16.0	-	without sample rotation
¹³ C	Z10163	≤ 0.50	≤ 5.0	≤ 7.0	≤ 1.0	with sample rotation, with ¹ H decoupling during acquisition

Water Suppression

Nucleus	Sample	Splitting (in %) ²	10% (in Hz) ³	50% (in Hz) ³	Signal-to-Noise Ratio	Remarks
¹ H	Z10902	-	≤ 160	≤ 80	≥ 500	without sample rotation, noise: 1.5 ppm

Gradient Recovery (Factory Test)

Nucleus	Sample	Signal recovery (in %)	Recovery time (in µs)	Gradient time (in ms)	Gradient strength (in T/m)	Remarks
¹ H	Z10083	90	≤ 100	5.0	≥ 0.39	with squared gradient shape on Z

¹ Signal line width is measured relative to the total intensity of the signal of interest (chloroform or p-dioxane).

² Splitting, i.e. resolution is measured on the doublet of the anomeric proton (H 1g) of the glucopyranosyl ring as percentage of the total signal height of the doublet.

³ Signal line width of the residual H₂O signal is measured relative to the intensity of the DSS signal at 0 ppm (sodium 2,2-dimethyl-2-silapentane-5-sulphonate).

● **Customer Certificate**



NMR CRYO Probe™

P/N: Z151340 S/N: 0001 Type: CP DCH 700S4 C/H-D-05 Z

Probe Design Information

		Remarks
Gradient Strength	≥ 0.53 T/m	with max current 10 A
Allowed Temperature Range	-40 °C to 80 °C	shim system must be kept in the range 0..80 °C

Samples

Sample	Description
Z10083	0.1 mg/ml Gadolinium Chloride (GdCl ₃), 0.1% Methanol- ¹³ C (¹³ CH ₃ OH), 1% H ₂ O in D ₂ O
Z10120	0.1% Ethylbenzene (EB) in Chloroform-D
Z10163	40% Dioxane in Benzene-D ₆ (ASTM)
Z10263	100 mM Urea- ¹⁵ N ([¹⁵ NH ₂] ₂ CO), 100 mM Methanol- ¹³ C (¹³ CH ₃ OH) in Dimethyl Sulfoxide-D ₆
Z10701	0.3% Chloroform (CHCl ₃) in Acetone-D ₆
Z10902	2 mM Sucrose, 0.5 mM DSS, 2 mM NaN ₃ in 90% H ₂ O + 10% D ₂ O (40 mm filling height)

Test date: 2016-10-10

● **5mm CryoProbe - Limitations**

NMR CryoProbe™



Probe:	CP DCH 700S4 C/H-D-05 Z									
Probe Part-Nr.:	Z151340	S/N	0001	EC:	00.00	MHz:	700	SB	✓	WB

Sample Geometric Limitations			
Maximum Sample Diameter	5.0 mm		
Recommended Sample Filling Height	40.0 mm		
Sample Depth	Maximum	Recommended (with 40mm filling height)	Minimum
	25.0 mm	19.0 - 21.0 mm	18.0 mm (16.0 mm) ¹

¹ for Shigemi sample tubes (please use Shigemi sample tubes with tapered edges on the bottom).

Sample Temperature Limitations										
VT Interface Box with black cooling fins: use the "High" setting unless otherwise specified.										
Recommended Gas Flow Rate ²	Min	535 l/h								
Sample Temperature Range ³	Min	-40 ✓	0	°C	Max	+40	+60	+80 ✓	+135	°C

² = effective Flow. With BSVT set 535 l/h. With BVT set 670 l/h
³ Operation below room temperature requires the use of a BCU05 or a BCU-X

Date: 11/10/2016

Signature: KKS

● **CP Packinglist**

NMR CryoProbe



IN	OUT	CRP: CP DCH 700S4 C/H-D-05 Z	Z-No: Z151340	S-No: 0001
	✓	Cryo Probe™		Pic. 01
	✓	VPM Cryo Probe Case	Z132538	Pic. 02
	✓	Customer Documentation		Pic. 03
		NMR Applications (Typical Pulses for CryoProbe™)		Pic. 04 A
		Customer Information for 1.7 mm MicroCryoProbes	ZTSC0001	Pic. 04 B
	✓	User Manual+Installation Manual+User Manual New	Z31551+Z31772+Z31773	Pic. 05
	✓	Protection Cap	Z 75863	Pic. 06
	✓	Transport protection (screwed onto the bottom)	Z71168	Pic. 07 A
	✓	BNC-Plug Protection Cap (screwed on BNC-plugs)	94106	Pic. 07 B
	✓	N-Plug Protection Cap (screwed on N-Plugs)	94105	Pic. 07 C
	✓	HE-Coupling Cap (screwed on He-Coupler)	Z110835	Pic. 07 D
	✓	Vacuum Valve	Z75874	Pic. 08 A
	✓	Two replacement O-Rings and HF-Sealings	49021+Z113810	Pic. 08 B
	✓	Unlocking Tool for VT hose connector of CryooProbe	Z136333	Pic. 09 A
	✓	Green Tuning Tool	Z132320	Pic. 09 B
		Only 400 MHz CryoProbe™, BNC-L BU-SFT	1229	Pic. 09 C
	✓	VT – Gas Connector	Z49100	Pic. 10
	✓	VT – Gas Connector 7m	23202	Pic. 11
		CryoProbe Cavity Cleaner 5mm	Z119123	Pic. 12
		Z4D11183A_CryoProbe_Cavity_Cleaner	Z31915	Pic. 13
		TopShim-GRAD/CP_05-CD + Installation Information		Pic. 14
	✓	Manually Tuning and Matching of a CryoProbe		Pic. 15
	✓	Important Instructions:	Z33099	Pic. 16



Pic. 01



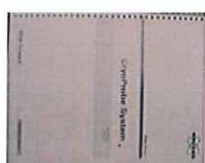
Pic. 02



Pic. 03



Pic. 04



Pic. 05



Pic. 06



Pic. 07



Pic. 08



Pic. 09



Pic. 10



Pic. 11



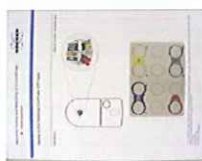
Pic. 12



Pic. 13



Pic. 14



Pic. 15



Pic. 16