CryoProbe™

Safety Information & Customer Certificate

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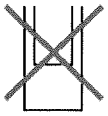
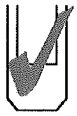
IMPORTANT

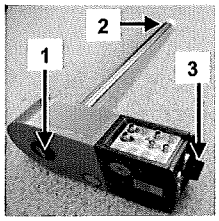
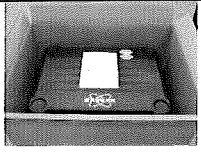
Please read the information in this document *carefully* before handling your CryoProbe!

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

NMR CryoProbe™

Step	Action
NOTICE	
 	**PACKAGING:** • 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 ***CryoProbe System User Manual or CryoProbe Prodigy User Manual***. • 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.
  	**MEASURING:** • 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 ***CryoProbe User Manual or CryoProbe Prodigy User Manual***.	 Fig 2: CryoProbe with protection covers.
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.	 Fig 3: CryoProbe in Bruker storage box.
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.	 Fig 4: Bruker storage box in cardboard crate.

Customer Certificate

NMR CRYO Probe™

P/N: Z161768 S/N: 0001 Type: CP TCI 800S4 H&F/C/N-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	8.0	11	15	
^{1}H	Z10263	80.0	-	-	CPD
^{2}H	Z10263	100	55	76	
^{13}C	Z10263	12.0	165	231	
^{13}C	Z10263	55.0	-	-	CPD
^{15}N	Z10263	32.0	187	244	
^{15}N	Z10263	170	-	-	CPD
^{19}F(HCOIL)	Z10234	11.0	10	15	

Sensitivities

Nucleus	Sample	Signal-to-Noise Ratio	Remarks
^{1}H	Z10120	≥ 8600	noise: 200 Hz variable, method: sino best
^{2}H	Z10902	≥ 10900	noise: 50 ppm, method: sino, 10% D_2O
^{13}C	Z10163	≥ 1550	noise: 40 ppm variable, method: sino best
^{15}N	Z10187	≥ 70	noise: 2 ppm variable, method: sino best, with ^{1}H decoupling during acquisition
^{19}F(HCOIL)	Z10234	≥ 5500	noise: 1 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

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	≥ 1200	without sample rotation, noise: 1.5 ppm

[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 H_2O 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: Z161768 S/N: 0001 Type: CP TCI 800S4 H&F/C/N-D-05 Z

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	≥ 0.49	with squared gradient shape on Z

Probe Design Information

		Remarks
Gradient Strength	≥ 0.66 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 ($^{13}CH_3OH$), 1% H_2O in D_2O
Z10120	0.1% Ethylbenzene (EB) in Chloroform-D
Z10163	40% Dioxane in Benzene-D_6 (ASTM)
Z10187	90% Formamide ($HCONH_2$) in Dimethyl Sulfoxide-D_6
Z10234	0.05% Trifluorotoluene (TFT, a,a,a-$CF_3C_6H_5$) in Chloroform-D
Z10263	100 mM Urea-^{15}N ($[^{15}NH_2]_2CO$), 100 mM Methanol-^{13}C ($^{13}CH_3OH$) 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_2O + 10% D_2O (40 mm filling height)

Test date: 2017-02-06

5mm CryoProbe - Limitations

NMR CryoProbe ™

Probe:	CP TCI 800S4 H&F/C/N-D-05 Z										
Probe Part-Nr.:	Z161768	S/N	0001	EC:	00.00	MHz:	800	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).			

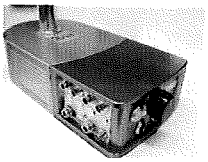
Sample Temperature Limitations										
VT Interface Box with black cooling fins: use the "**High**" setting unless otherwise specified.										
Recommended Gas Flow Rate [2]	Min	535 l/h								
Sample Temperature Range [3]	Min	-40 ✓	0	°C	Max	+40	+60	+80 ✓	+135	°C
[2] = effective Flow. With BSVT set 535 l/h. With BVT set 670 l/h [3] Operation below room temperature requires the use of a BCU05 or a BCU-X										

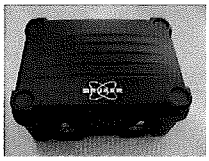
Date: 07/02/2017 Signature: KKS

CP Packinglist

NMR CryoProbe

IN	OUT	CRP: CP TCI 800S4 H&F/C/N-D-05 Z	Z-No: Z161768	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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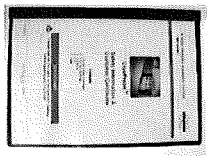
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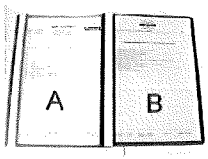
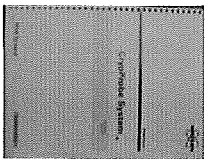


Pic. 04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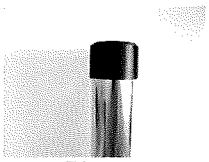
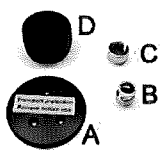
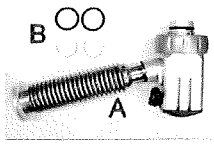
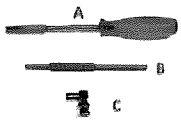

Pic. 06



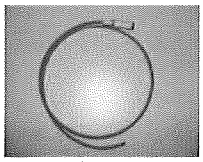
Pic. 07



Pic. 08



Pic. 09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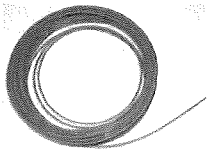
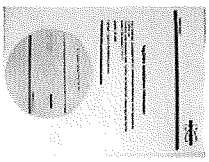

Pic. 11


Pic. 12


Pic. 13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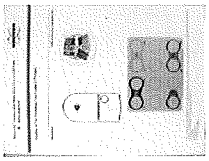
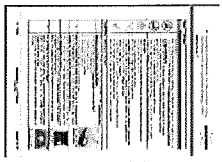

Pic. 15


Pic. 16

Equipment Clearance Form

Decontamination / Safety and Repair Declaration form for general purpose equipment handling

A. Equipment Identification[1]

Part Number	.....	Equipment	.....
Serial Number	.....	Bruker Order No.	.....
RMA No.[2]	.....	Customer Reference	.....

B. Equipment Owner / Sender[3]

Company/Institute	.....	Address	.....
Contact Name	.....	City/Postal Code	.....
E-Mail	.....	Country	.....

C. Potential Hazards and Decontamination[4]

Has the product been contaminated? ☐ **No** ☐ **Yes**[4] [mandatory entry]

Biological Hazard: ☐ **No** ☐ **Yes**[4]

Biohazard material and warfare agents are not accepted. Bruker will neither accept such a delivery nor carry out any repair.

Radioactive Hazard: ☐ **No** ☐ **Yes**[4]

Radioactive material is not accepted. Bruker will neither accept such a delivery nor carry out any repair.

Physical / Health / Environmental Hazard: ☐**No** ☐**Yes**[4] - on Yes, please specify former hazard/s:

☐ Explosives ☐ Flammable ☐ Oxidizing Liquids ☐ Com-pressed Gas ☐ Corrosive to Metals/Skin ☐ Acute Toxicity ☐ Skin Irritation ☐ Aspiration Hazard ☐ Hazards to Environment

List Hazard Materials: .....

Any Remarks concerning Safety: .....

D. Purpose of Repair Declaration[5]

☐ **Repair** ☐ **Upgrade** ☐ **Loan Return** ☐ **On-site Repair**[8] ☐ **Exchange** ☐ **Disposal**[5] ☐ **Other:** .....

E. Fault/Failure Description[6]

Fault/ Failure					
Failure Date		Application		Equipment was never operated[8]	☐

F. Return Instructions for Bruker

☐ Return after Repair / Upgrade ☐ Do not return / Release for Disposal ☐ N/A – please contact me / us

☐ Exchange unit received or agreed on, please specify: .....

G. Safety Return Declaration[7]

It is the explicit responsibility of the customer to make sure that the returned products are free of any hazardous substances. Failure to do so will result in Bruker holding the customer liable for any injuries, damages or expenses resulting from exposure to the hazardous substances.[7] Any product returned without a fully completed and duly signed declaration will not be accepted. This form must be attached **to the package exterior** together with the other shipping documents.

The customer/signatory confirms that the returned product is decontaminated / is free of any hazardous substances.

☐ **I / WE HAVE READ THE TERMS AND CONDITIONS ABOVE AND** on page 2 **AND ACCEPT THIS OBLIGATION**

Name: ..... Signature: .....

Function: ..... Date of Issue: .....

☐ Tick this box, if signed by a Bruker service representative[8] Contact at Bruker[1] : .....

Return Acceptance – TERMS AND CONDITIONS

1 Purpose of this Form

Do not send any equipment back without previously getting in touch with Bruker on the matter. – see also ***2.*** *and* ***7.***

Complete and sign this form whenever a product, a system or one of its components situated in a laboratory or inside an analytical instrument is to be returned to Bruker or when a Bruker representative needs to carry out an on-site repair.

Any equipment received by Bruker must be in decontaminated condition. – see also ***4.*** *and* ***7.***

2 Return Material Authorisation (RMA)

It is the decision of Bruker whether equipment will be accepted to be returned. Depending on the requirements of the Bruker service organisation an RMA number has to be obtained from Bruker prior to shipping.

Please contact Bruker if in doubt whether an RMA number is required.

3 Equipment Shipping / Transport

Local and International packaging, transport (for dangerous goods: ADR, RID, ICAO) and customs (where applicable) regulations must be observed and adhered.

This filled-in and signed form must be attached **to the outer package exterior** together with the other shipping documents.

4 Decontamination Declaration

Specify potential hazards using the CLP hazard signs, according to the European CLP-Regulation (EC) No 1272/2008 (classification, labelling and packaging) in alignment to the Globally Harmonized System for hazardous substances (GHS).

Only professionally and appropriately decontaminated equipment is acceptable for a return and further actions at Bruker.

Radioactive or Biohazard hazard materials are not accepted at all.

The form must be signed by the safety representative or by a person in charge with similar or higher responsibility on customer´s side.

5 Disposal

If the equipment is marked for disposal, Bruker will dispose of or recycle the equipment without any further notice to the customer. Bruker cannot be held responsible for any possible loss incurred.

6 Fault/Failure Description

If the available entry space is not sufficient, please use additional pages, where a unique affiliation to this equipment clearance form is given, e.g. best choice via the RMA no. (if available)

7 Unacceptable Risks

If Bruker suspects an unacceptable risk to humans or the environment due to contamination, Bruker reserves the right to refuse receipt of goods. If the equipment is found to be contaminated, regardless of the signature on this document, the equipment will be decontaminated or disposed of at the customer's risk and expense.

8 System/Equipment was Never Operated by the Customer

If the equipment has never been used or operated by the customer (e.g. prior to completion of the installation) the form may be signed by a Bruker service representative instead of the customer's safety representative.

Please tick the provided checkbox.